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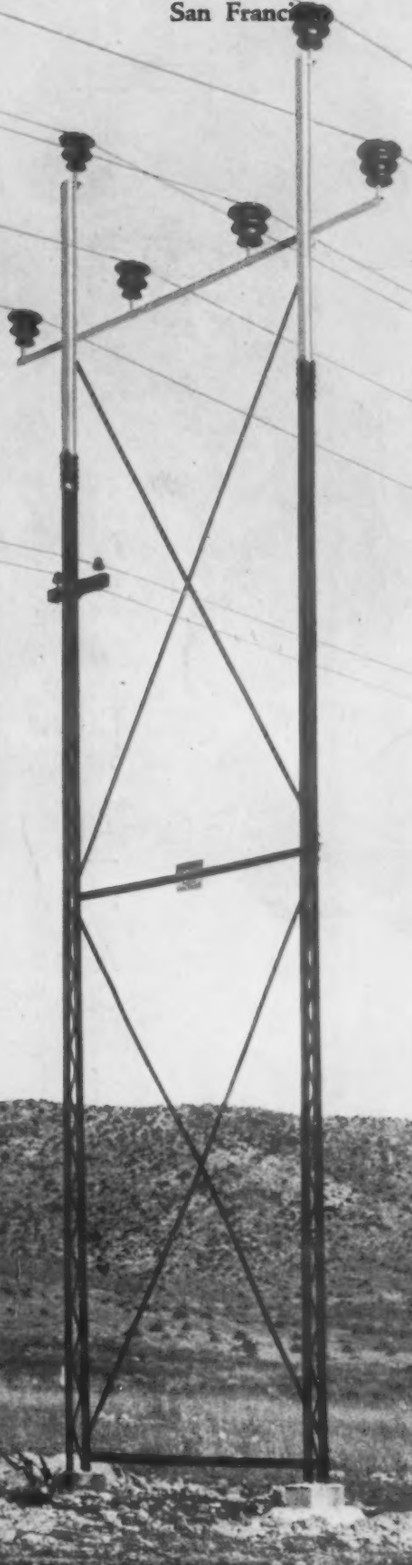

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Journal of Electricity and Western Industry

A semi-monthly chronicle of western events, advocating the economy, efficiency and convenience of electric power for all industries of the West—manufacturing, agricultural, mining, merchandising, home building and home making. Interpreting the value of electrical development to the business and financial man, the industrial man, the power man, wholesaler and retailer, contractor and constructor, engineer and home owner.

Because of the abundance of water power in the West susceptible of economical development, a dependable, uninterrupted supply of cheaper electric power is assured for these industries. The basic industry of the West—hydroelectric power generation—for which Journal of Electricity and Western Industry is the spokesman, is therefore logically and inseparably linked to the growth and prosperity of all phases of our daily life and business.

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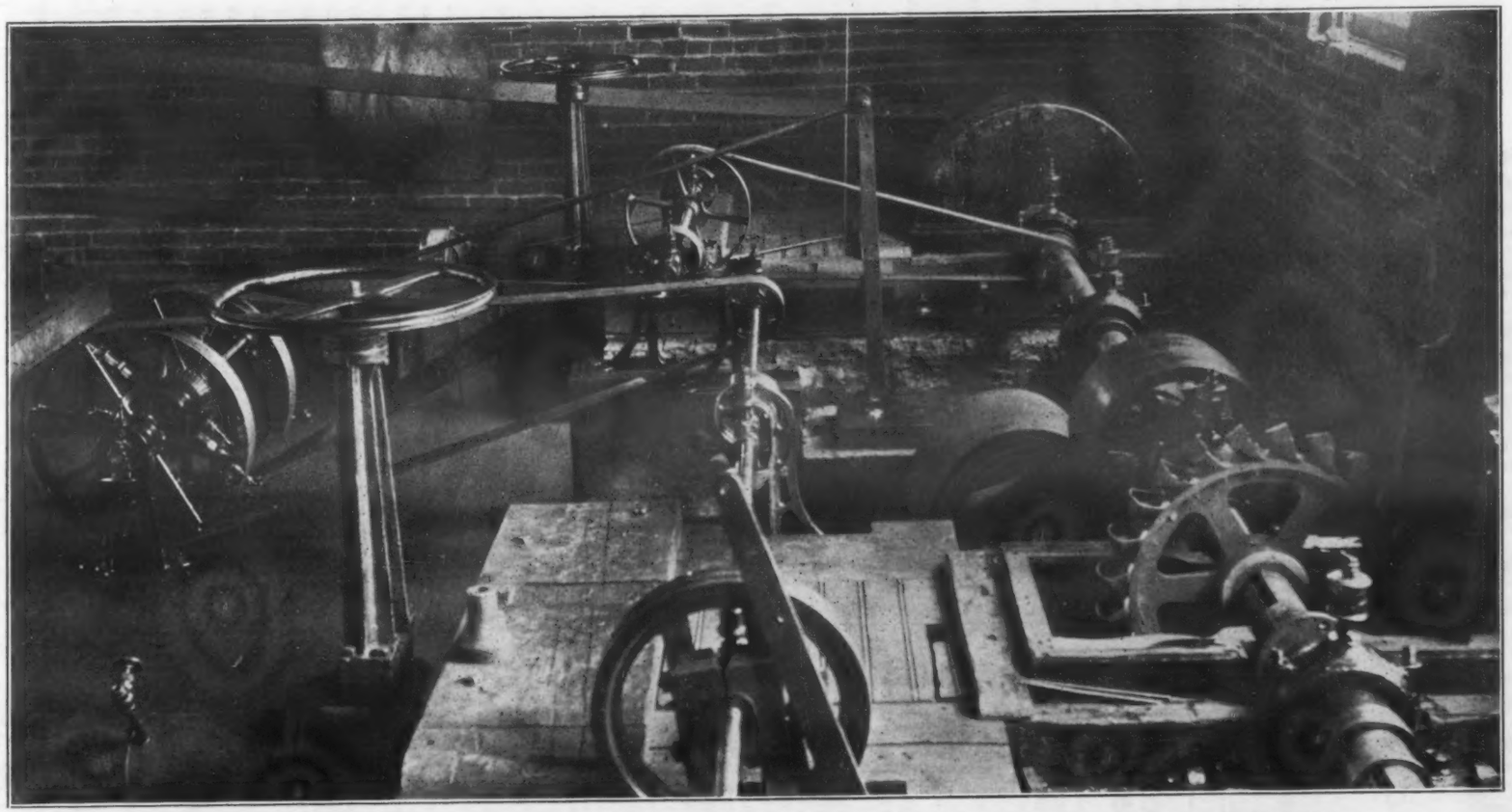

THE BIRTHPLACE OF HYDROELECTRIC GENERATION IN THE WEST

IN 1885 the Aspen Electric Company of Aspen, Colorado, installed what is claimed to be the first hydroelectric plant in the United States, at the smelter of the Aspen Mining and Smelting Company. This pioneer installation consisted of a 60-light Brush arc dynamo belted to a Pelton wheel under a 70-ft. head. The view shown above is a plant established in 1887 by the Roaring Fork Electric Light and Power Company, the successor of the Aspen Company. The Pelton wheel in the foreground was used to drive a Westinghouse alternator carrying a load consisting of incandescent lamps. This load varied so gradually that it was easy to maintain the speed nearly constant either by hand or by an old-style Woodward governor. The wheel in the corner drove a 100-kw. Edison bi-polar 500-volt generator supplying power for a number of electric hoists. The changes in the load were sudden and great. To overcome racing and regulate the speed of the generator the installation was equipped with a differential governor. The rate at which the governor acted is proportional to the difference in speed between the two water wheels; that is, it worked quickly for a large change in load and slowly for a small change, thus keeping the speed of the wheels fairly constant. The impulse wheels here shown which were the finest in their day, are but toys compared with the modern wheels of the same type which weigh twenty-five tons when assembled.

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Journal of Electricity and Western Industry

A McGraw-Hill Publication

ROBERT SIBLEY, EDITOR

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Norman S. Gallison Clotilde Grunsky George C. Tenney

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What the Disarmament Conference Promises for the West

TO a world grown impatient of diplomacy, the disarmament conference called by President Harding at Washington has offered an inspiring picture of divergent races and folk of alien interest sitting about one table and expressing sincerely—and it almost seems for the first time in all this tangle of war settlements—the willingness to sacrifice something of their selfish ends for the common good.

It was the privilege of the editor of the Journal of Electricity and Western Industry to hear Sir Arthur Balfour, chairman of the British delegation to the Washington conference, when he said: "He who proposes cooperation must be willing to set the example by sacrifice. Your country has set an example of such practical sacrifice to bring about disarmament that the nations of the world are ashamed to do aught else but follow your lead. Other developments of far-reaching consequence in the advance of the peoples of the earth are bound to follow." The words swept to enthusiasm the great audience which heard him, and the impression of sincerity and good faith—of all that is farthest from the dark ways of early diplomacy—will remain to those who heard the words as a great hope.

To the West, the conference has already stamped itself as the most important event of recent years. The four-party guarantee of peaceful progress on the Pacific has shunted into positions of secondary importance such minor irritations as the Japanese issue in California and other western commonwealths. There have been times during the past few years when it has seemed that all the vaunted opportunities awaiting development upon the shores of the Pacific would be swept into the conflagration of racial controversy fostered by an inflammatory press.

The primary essential to a prosperous Pacific is a peaceful Pacific. There still remain—and will arise in the future—differences between nations and races which must be settled, but with recognized fair dealing as the basis for settlement, there is no reason why their discussion should cloud international friendliness.

One European authority has recently written, "The heirs of Europe are the United States and Japan . . . The Pacific Ocean, long out of touch with commercial centers, . . . is awakening to independent life. Her shores that, for a century, had turned, one to the West and the other to the East, now look to each other, and are becoming the coasts of a new Mediterranean."

With the inevitable long period of recuperation, before Europe can again take its normal place as an absorber of our surplus products and the tremendous awakening which the Orient has shown, it is obvious that for the United States in particular, the sun is beginning to rise in the West. And to the continuing spirit of international sacrifice for which Secretary Hughes has set the example, we may look that this scientific phenomenon presage a day of sunshine indeed—and not the thunderstorm.

A National Program That Means Much to the West

AT times we become so absorbed in following the wonderful accomplishment for our industry that is being brought about by the Pacific Coast Electrical Association and the Northwest Electric Light and Power Association that we are prone to overlook the substantial work for the West that is being accomplished by the parent body—the National Electric Light Association.

A listing of a few of the outstanding present activities of the national association should as a consequence prove interesting and instructive to western men who have at all times given such loyal support to the association, even though at certain periods the net returns to the West seemed inadequate to meet the outlay involved.

Foremost in national engineering effort of vital interest to the West, is the splendid work on inductive interference that is continually being accomplished in the national association by its engineering specialists, among them being W. J. Canada, a national authority, devoting his entire time to this work.

Following closely upon this work in importance is that of Mr. Herbert, who is bringing about standardization in accounting that is timely and helpful. In the states of Washington, Oregon and California at the present time the question of uniform action in handling depreciation is of utmost importance in view of certain activities of the Federal Water Power Commission which seem unjust and economically unsound to western development, comment upon which is made editorially elsewhere in these columns.

An activity of tremendous import to industry generally was the water power conference held at Washington during the past season under the aus-

pices of the National Electric Light Association, in which national leaders of all branches of industry appeared before the Federal Water Power Commission and presented the necessity for definite policies in national water development. This forceful presentation carried a message home to the commission and to the people at large that can not fail to net helpful results. This complete symposium has been published by the association and its contents constitute an important contribution to our present day knowledge of the subject and its importance to industry at large.

After a year's careful study the association has drafted a model state law for commission regulation which should prove helpful in states where such laws do not at present exist or where amendments to present laws seem desirable.

National publicity on electrical matters is still fostered by the national association and some seventy-five thousand dollars will again be spent for national advertising. Particular emphasis is being stressed upon receiving additional advertising of the indirect type which appeared some months back in Collier's connected with the Providential Insurance Company. Along with this publicity is the theater exhibit of "Little Kilowatt" which is being exhibited in hundreds upon hundreds of moving picture theaters throughout the nation.

A new department is that of introducing economic courses in colleges and universities dealing with the discussion of public utility problems. A number of universities — among them Columbia, Chicago, Iowa and the University of California— have already held a series of public lectures given by outstanding executives in the public service industry.

Other activities deal with the forwarding of state laws to enable the three hundred or four hundred million dollars annually accumulated in savings banks to become available for possible use in hydroelectric securities, but foremost and above all a deep study is being given to how best a national movement may be instituted to put over completely the national customer ownership idea.

All these matters are of tremendous import to the progress and rise of the public service industry. They take money to carry them on and the West shares in the general resulting good from these national accomplishments. The progressive spirit which has done so much in forwarding the electrical industry west of the Rockies is in full accord with the splendid work of the National Electric Light Association and stands ready to continue and to further its substantial support of the past.

The Handwriting on the Wall in Canada

THE recent election returns in Canada which indicate that the Liberals appear to be coming into power with 235 seats as compared with the 50 held by the Conservatives, augurs much for a return of sanity in a situation which has recently become highly involved. It means that in Canada there will be less governmental interference with private enterprises during the years immediately ahead. Along with this thought, it is interesting to follow the announced policy of Premier Drury of the Province of Ontario that he will, of course, see the Hydro Electric Commission of Ontario through in spite of the enormous additional outlays of money that are being required for the Chippewa Development, but in matters of proposed axial electric railway lines paralleling existing steam roads, he will not lend his influence.

There is much for us to learn from this experience in Ontario, Canada, in recent years—much that might be helpful for us to imitate and much, vastly much, more that we should avoid.

Eastern Inaccuracies of Western Origin

THERE has been much criticism of the Edison questionnaire. Many of these questions, such as "Give the states bounding Idaho," or "What is the capital of Pennsylvania?" were generally ridiculed by the press and declared to be either matters of such common knowledge or of such uselessness in application as to be unbecoming serious consideration by a man of Mr. Edison's attainments.

If anyone doubts the general misinformation of public or even of business men who ought to know better, try out some of these questions on a few friends in other sections of the country and note the result.

So far as the eastern conception of the West is concerned, the gross ignorance that prevails is truly amazing. Great newspapers of Chicago, for instance, published recent pictures of the football stadium at Seattle seating 30,000 people and heralded this broadcast as the greatest stadium of the West, evidently ignorant of the Stanford stadium and its 60,000 capacity. Again, one of the great dailies in New York showed a picture of the Longlake dam of the Washington Water Power Company which they state is near Spokane, Washington, and yet they follow it by saying that this power plant furnishes Seattle with its major power supply, supremely ignorant of the fact that Spokane is hundreds of miles to the east of Seattle.

The literature one finds for public distribution concerning the West is so faulty, inaccurate and untruthful it certainly makes one blush to feel that with all our modern drive for accuracy and truth in presentation, the goal of attainment is so far from being accomplished.

The eastern papers can only be corrected by their own effort, but so far as the West is concerned we ourselves can play a helpful part in this by seeing to it that more accurate statistical data is sent out and that uniformity of statement is observed in the various pamphlets and promotional matter that is sent forth. This is a matter for joint action of chambers of commerce of the West and if they fail in this duty, then a vigilance committee ought to originate among the well-wishers of the West and the matter be taken into their own hands.

Beware of Losing the Confidential Contact

THE Federated American Engineering Societies propose the formation of an employment bureau to render employment service on a commercial scale—that is, the engineer who secures a position is to pay a definite percentage of his first year's salary for the service rendered. Hitherto local engineering clubs have performed this service gratis, as have also many of the national engineering societies. This relationship has indeed in many instances done much to foster the confidential contact of the particular organization with the membership at large. Under no circumstances should this service be done away with or lessened in its activity due to the proposed broader activity of the Federated Societies. However, anything that can be done to facilitate the continuous employment of engineers is to be welcomed, and all recognize that in the main it would be better that this activity be self-supporting. Hence, we commend the Federated American Engineering Societies for their announced advocacy of this new undertaking and urge upon member engineers to give the movement all the support the movement needs to make it a success.

The Recent A. S. M. E. Convention at New York

WITH its membership roll containing the names of men of achievement from all branches of engineering, the American Society of Mechanical Engineers has assured for itself a special position of national importance in engineering circles. It is doubtful if any other of the great national engineering societies can boast of the brilliant gathering of noted engineers which today marks the annual convention of the A. S. M. E.

At the recent gathering in New York City, the conduct of the meetings and the personnel in attendance were unusually impressive. E. S. Carman, the outgoing president, Wm. H. Kenerson, chairman of the Local Sections Committee, and Calvin W. Rice, the secretary of the Society, were undoubtedly largely responsible for the snap and ginger with which things moved.

It is particularly gratifying to a westerner to recall that the incoming president, Dexter S. Kimball, although now Dean of Engineering at Cornell University, is a product of the West. Among the traditions of the good old days at the Union Iron Works of San Francisco is that of the efficient workmanship of the now famous Dean Kimball, then a young man working at a lathe in the shops in order later to complete the course in mechanical engineering at Stanford University.

The American Society of Mechanical Engineers, now fifteen thousand strong, financially sound and with a gross income of half a million dollars, stands without a peer among engineering societies. May the coming year under the leadership of Dexter S. Kimball, develop its promise of unparalleled achievement!

Discontinuing the Airplane Forest Patrol

AS a part of the Dawes economy curtailment, Congress has cut off the appropriation which made it possible for the Aviation Service to cooperate with the Forest Service in maintaining the airplane patrol of the National Forests that has been so effective in the past two summers. Those who are acquainted with the great aid rendered in preventing fires and preserving the timber of the National Forests know that a curtailment of this sort is false economy, because without the air patrol the country stands to lose timber of value far exceeding the cost of maintaining the patrol.

In the issue of the Journal of Electricity and Western Industry of October 15, 1920, practically the entire editorial pages of the issue were given over to this important work in the West and great stress was there laid upon the value of the airplane in the prevention of forest fires. Since that time many occasions have served to strengthen the conviction of those who have the conservation of our great forest reserves nearest at heart that this protective work must under no circumstances be dispensed with.

Officers of the Aviation Service are anxious to have the forest patrol continued because it affords a "field service" training for pilots and observers that is more practical and hence more effective than a corresponding number of "hours in the air" over landing fields at flying schools. After a season on forest patrol work an aviator is accustomed to cross-country flying and has had experience under conditions that closely resemble war-time duty.

The Forest Service is convinced that the Air Patrol is a very valuable agent in forest protection, first, through supplemental aid given in the detection of fires; second, in making a reconnaissance of large fires and in some instances directing the fight from the air through radio; third, in the quick transportation of fire fighters from other parts of the forest territory; fourth, as an agent in public education on fire patrol. The saving in the mere expense of fighting forest fires has been reduced by many thousands of dollars annually on the Pacific Slope through the aid of the airplane.

However, it should be remembered that the people's interest is far greater than the interest either of the Aviation Service or the Forest Service and that the training of aviators and the cost of fighting fires, which in themselves seem to be good and sufficient reasons for continuing the air patrol, are exclusive of and in addition to the fundamentally important consideration of conserving our timber resources. There is no citizen of the west coast who is not in some way, directly or indirectly interested in our forest resources or their products. If the need and will of the people can be shown to be contrary to legislative enactment, we have faith enough in Americanism to believe that the offending measure will be changed.

Western Comment on Current Events

Editorial Notes and Readers' Views on the Outstanding Aspects of Financing, Trade Promotion, Legislative and Associated Topics that have a Special Bearing on Western Business

Montana Mines to Resume Operations

Long Period of Idleness to Close With Opening of Copper and Zinc Plants on January 16, According to Announcement

ENFORCED shutdown of the copper and zinc industry of Montana which has obtained since April last, owing to the depression of the metal market, will be ended on January sixteenth, according to a formal statement issued by the various companies operating in that district. Eleven companies will resume operation on that day, under a somewhat lower scale of wages but with the assurance of permanent employment.

This involves not only the greater number of the mines, but reduction works as well. The Anaconda Company further announces that it has completed arrangements to purchase zinc concentrates in such quantity as to produce six or seven million pounds of zinc at the electrolytic zinc plant at Great Falls. With the purchase of the American Brass Company by the Anaconda Company, it is felt that a factor of stability has been introduced into the situation which means much to the copper industry, as this concern consumes an amount of copper and zinc in excess of the capacity of the Butte camp.

The present reopening of the copper plants marks the end of what has undoubtedly been the worst depression ever experienced by this region. With surplus stocks reduced and other factors which make for a healthy state of the metal industry, it is expected that the Intermountain district is now in a position to grow steadily in prosperity in all fields.

Shipping Pool Plan for Pacific Ports

Tentative Plan For Joint Operation of Ships by Coast Cities Receives Endorsement of Local Chambers of Commerce

PLANS for a combination of all Pacific Coast shipping interests to pool allocations of Shipping Board vessels have created much interest in Pacific ports. The proposal comes from Herbert Fleishhacker, president of the Anglo and London Paris National Bank of San Francisco, as well as vice-president of the Great Western Power Company, who was recently called to Washington to consult with the shipping board on some method of solving the shipping problem.

According to the proposed plan, the Shipping Board vessels would not be assigned to any particular port, but would go to the shipping combine, which would cover the coast from Puget Sound to San Diego and would operate along the lines of the International Mercantile Marine on the Atlantic coast.

Although details of financing the plan have not been announced, it is understood that all shipping interests will be invited to enter the $30,000,000 pool to purchase ships from the Shipping Board. Twenty ships have been suggested as necessary to present Pacific coast needs. These would ply out of the larger ports of the Pacific coast and would make two sailings a month from each port, operating on the trade routes between coast and Oriental ports and along the west coast of South America. The home ports will be San Diego, Los Angeles, San Francisco, Portland and Seattle. It is reported that favorable action in supporting the proposition has been taken ports will be San Diego, Los Angeles, San Francisco, Seattle, Tacoma, Los Angeles and San Diego. Portland had appointed a committee for its consideration but had not taken action at the time of our going to press.

This suggestion offers a possible way out of the general dissatisfaction and turmoil which have resulted from the recently announced allocation of vessels to Pacific ports and is finding general support in coast shipping circles.

The California Oil Situation Outlined

Increase in Producing Area Will Not More Than Maintain Past Production, Says State Mining Bureau Expert

OF value in estimating the importance of saving oil through hydroelectric development, is the recent report of the California State Mining Bureau in which the extent and producing possibilities of the proved oil lands of that state are analyzed by R. E. Collom, State Oil and Gas Supervisor.

California production of oil for 1921 will be close to 114,000,000 bbl., the largest of any year on record. Figures given for acreage and producing wells indicate that proved oil lands have increased from 80,762 acres in 1916 to 94,567 acres in 1921, producing wells during the same period growing from 6,409 to 9,642. Production figures range from 87,073,195 bbl. in 1916 and 103,184,724 bbl. in 1920 to the figure given above. Part of the acreage added has come from new developments in fields already producing. In some cases, on the other hand, land formerly classified as proved oil land has been removed from this classification when drilled.

The bringing in of the Montebello oil field of Los Angeles county accounts for the greatest increase in production. Other fields opened for development since 1915 are the Casmalia, Richfield, Ventura, South Mountain, Elk Hills and Huntington Beach. Together new fields have yielded 52,075,378 bbl. of oil, which is 11% of the total oil produced.

The development of these new fields and the further development and addition of proved acreage to old fields, however, has done little more than maintain the state's production. Although during the past summer there was an overproduction, due to the flush production in the new Elk Hills area, it is questionable whether the state's output will be as successfully maintained during the period 1921-1926, inclusive, as during that of 1915-1920.

Mexican oil, to which we have looked to make up our national deficit in oil production, is recognized as nearing exhaustion, and with the burden on local production inevitably largely increased in the next decade, hydroelectric development must be ready to meet the growing needs of western industry.

Denver Eight Cent Car Fare Sustained

Old Controversy on Validity of City Franchise Restrictions Settled by U. S. Circuit Court in Favor of Higher Fares

PERMISSION to establish an eight-cent maximum fare is involved in the order of the United States Circuit Court of St. Louis which confirms the action of District Judge Lewis of Denver, granting the Denver tramway company an injunction against the city and county of Denver.

The court held that a city franchise ordinance, which provides for a maximum six-cent fare, was not in the form of a contract and if there were a contract, it would be void because of lack of mutuality. The company is in the hands of a receiver.

The present case grew out of the anomalous conditions of a year or two ago when the company was unable to meet the demands for higher wages of its striking employes, owing to the fact that it was not allowed to raise its fares by the city government, who, nevertheless, required that service be given. The entire mix-up was an example of the dangers and ignorance involved in local regulation—and the decision of the court which confirms the action of the Denver court is welcomed as preventing further costly absurdities.

West Coast Neglecting Southern Trade

Improved Credit Situation in Mexico and South America Offers Opportunities Which Pacific Coast Is Neglecting

THAT Pacific Coast business men are not taking advantage of the trade opportunities opened to them in Mexico and South America, is the report brought back by manufacturers and Chamber of Commerce men recently returned from that district. Since the steamship connections have been established between Pacific Coast ports and Baltimore, western goods are being distributed to some extent as far east as Mexico City as cheaply as goods can be delivered from New York. There are, however, few western sales representatives to be seen in this district and at a recent meeting held by the American Chamber of Commerce in Mexico City, very widely attended by representatives of eastern and middle western houses, one westerner was present.

Mexico already ranks third among the nations of the world as a customer of the United States, only England and Canada purchasing more goods from this country, and further, at the present time ranks among those nations showing the most favorable credit situation. This is indicated not so much by increased volume of present trade as by extensive orders for the future along every line of demand. The same promising conditions are reported from Colombia and Peru. The entire west coast of the Americas, indeed, is reported in preferred financial position.

Better rail connections are needed to the south to close the ninety-mile gap at the northern terminus of the Southern Pacific Railway of Mexico, but it is expected that the improved stability of the country under the present administration will lead to the completion of the project. Western business men already enjoy good water connections with the south—and returned travelers urge on all sides that they cannot afford to wait longer to contest for their share of this attractive trade.

Business Effect of the New Tax Law

Provisions of National Tax Measure Agreed Upon in Congressional Conference Involve $700,000,000 Saving

MUCH disappointment has been expressed in business circles over the new revenue act to reduce the surtax rates to a point where recipients of large incomes would be attracted to industrial investments instead of non-taxable securities. The bill, however, contains many constructive provisions. It is figured that some $110,000,000 will be saved to American business annually through the reduction in corporation income tax. The bill greatly simplifies the collection of revenues and in its various provisions is of special importance to public utility corporations and other corporations which are earning small percentages on the capital invested. Among its provisions are:

A 12½ per cent corporation income tax.

No specific exemption of $2,000 for corporations having net incomes in excess of $25,000.

Corporations excluded from benefits of reduced rate on capital gains.

Capital-gain provisions allow complete deduction for capital loss.

Gains or losses in exchange of like kind ignored.

Dividends and interest not in excess of $300 from local building and loan associations exempted.

It is estimated that the bill will relieve the country of more than $700,000,000 in taxes during the two years which it covers.

Letters to the Editor

Geologist Discusses Relation of Damsites to Earthquake Faults

To the Editor:

Sir: At a recent meeting of the Commonwealth Club in San Francisco held to discuss the subject of earthquakes, mention was made of a proposed map of California which should show the location of the geologic faults that traverse our mountains and valleys. It was stated that such a map would be of material value to engineers, who might thus be informed regarding risks from earthquakes and might design dams or other structures accordingly.

It is well understood that the quake of 1906 would not have caused the disastrous fire if the water system of San Francisco had been properly located and designed to meet the effects of the earthquake, and it was demonstrated by the dams of the Spring Valley Water Company, which are

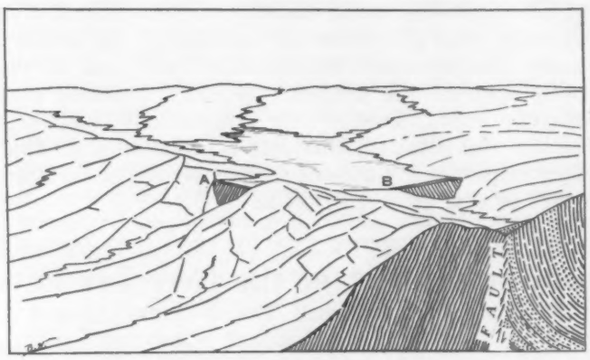


Diagram showing two types of damsites of common occurrence in California and their relation to a fault in the subterrane. The plane of the fault extends along the valley, under the reservoir, parallel with the ridge in the foreground.

built on the San Andreas fault, that good engineering can successfully insure such structures against failure. But if the engineering is to be good the engineer must be informed as to the movements that are likely to occur in the foundations.

Engineers, however, are as a rule not adequately trained in geology to recognize faults, and may without misgiving erect structures quite inappropriate to withstand the displacements which, from time to time, occur. If faults were few or if the stability of dams were a matter of little concern we would not need to discuss the question. But in California faults are very numerous and dams are basic structures for water supply and power. Their failure, furthermore, may occasion instant calamity.

I beg that you allow me to illustrate a pertinent condition, which is of rather common occurrence in the state, and in order that I may do so briefly I would ask permission to state without argument some possibly unfamiliar facts.

The first fact is that the rivers of California are as a rule older than the mountains through which they flow. Many brooks, it is true, have grown from the rivers up the mountain slope as gullies grow in a field, and they are younger, but the larger streams are generally older than the mountains.

This means of course that the comparatively young ranges have been pushed up while the rivers continued to flow. A swift-flowing river cuts a canyon, and it often happens that a canyon is cut deeper as fast as a ridge is raised higher. In that case the river maintains its course across the rising mountain block. A case in point is the passage of the Sacramento river through the Coast Ranges at Carquinez straits and the Golden Gate, these channels having been cut by the river before the bay region was submerged.

The accompanying illustration is designed to show a valley which is located upon a fault and the two kinds of damsites which may result from the development of the ridge and valley. It will be understood that ordinarily either dam would exclude the other. Thus the dam at **A** is located in the canyon cut where the master stream crosses the ridge. It runs parallel with the fault line and is liable to rupture only in case of violent movements such as characterize a great earthquake. The dam at **B**, on the other hand, crosses the fault line, and displacements occurring on the fault would pass through it transversely.

Examples of damsites having the general topographic relations illustrated at **A** or **B** will occur to any engineer familiar with the subject. The locations offer great advantages, a capacious reservoir, the confluence of streams, and a narrow outlet. But the fault which lies hidden beneath the alluvium of the valley constitutes a source of danger which may readily be overlooked. The engineer may possibly be excused for such an oversight on the ground that his experience in regions of less active mountain growth is with ridges and gorges whose development does not involve faulting. When streams sink their channels in a heterogeneous rock mass they carve away the softer and leave in relief the harder beds. The master streams, however, if they have sufficient fall and volume, may cut canyons across hard rock ridges upon which they become superimposed. The resulting conditions may then present a damsite topographically not unlike that figured at **A**, except that there is no fault beneath the adjacent valley.

The criteria by which the presence of a fault in the subterrane may be recognized pertain to geology. They are seen in the forms of the ridges and their slopes; in the arrangement and development of the rivers and their tributaries; and in the relative ages and attitudes of the rock masses. It requires a trained eye and an intimate knowledge of the local geology to recognize these evidences. It therefore seems desirable that engineers should be more generally informed regarding the possible or probable occurrences of faults, and it is to that end that the Seismological Society of America is planning to publish the Fault Map of California. Even though we must acknowledge that our knowledge is incomplete and that no general statement can take the place of direct examination in any particular case, yet the map will serve as a means of reference and may help to reduce the risks to the community from earthquake shocks.

BAILEY WILLIS.

President, Seismological Society of America.

Dayton Engineer Gives Personal Ideas on British Fuel Situation

To the Editor:

Sir: The liquid fuel situation in England is serious, as we all know, but rather than trust to reports, the writer has recently made a trip to that country to see personally how matters stood in this direction.

Since pre-war days there has apparently been a great falling off in the use of the automobile, due to the great increase in initial cost as well as the high cost of gasoline. This problem was so acute and the price (about 80 cents an imperial gallon) so high that a committee of investigation was recently appointed to report. About one-half the total

import of gasoline comes from the United States, rather more than 100 million imperial gallons per annum, and the findings of the committee were to the effect that the price of both the product in New York and the freight rates were higher than need be. Benzol, which was looked to as a substitute, is gradually being taken over by the oil companies themselves, and the price kept up.

My personal investigation of the fuel situation in England, leads me to the conclusion that the high original price paid in America may be due to the desire on the part of the British user to have only the cream of the gasoline. The majority of cars of British make will not burn the lower grade of fuel we get in the States and the people themselves do not appreciate how the fuel will have to be put on the market if adequate supplies are to be kept up.

A problem which has aroused great interest in England is that of the wholesale generation and distribution of electric power. It may be remembered that there has been an agitation for the generation of electricity wholesale at the coal mines. Sir Dugald Clerk, the leading authority on the internal combustion engine in England, has made a deep study of the problem of coal conservation during recent years. During my visit to England I had the pleasure of a long interview with him. Sir Dugald is a keen gas man; he is not in favor of the superelectric station for England, and in his opinion, from the coal conservation point of view, a gas service would be nearly twice as economical. He contends that the thermal efficiency for the generation of heat quantity by gas is over five times that of electricity. Under English conditions, the inverted incandescent gas lamp requires the use of 47 B.t.u.'s at the gas works, for each candlepower-hour obtained, while the one-watt electric lamp requires 54 B.t.u.'s and the half-watt lamp 31 B.t.u.'s at the generating station. High pressure incandescent gas burners mean 23 B.t.u.'s per candlepower-hour and flaming arcs 13.

He makes a comparison of the motive power for the two, but so far as the Pacific Coast is concerned, this is of little interest as the electric motor is pre-eminent. In England the efficiency of the gas engine is 1.6 times that of the electric motor on the basis of heat required at the generating station or the gas works. The real competition between the two systems is therefore confined to illumination. A visitor to London cannot fail to remark the very fine gas illumination in the public streets.

A controversy is raging on the subject of house warming. Here is a chance to show what electricity can do. It would scarcely be feasible to warm an English house by electricity, but at least the dampness could be reduced and local sun type radiators employed to keep chills away.

ROBERT W. A. BREWER.

The Engineers' Club, Dayton, O.

American Valuation Plan Urged as Solution of Present Tariff Problems

To the Editor:

Sir: Conditions of foreign exchange, especially in Germany, necessitate legislation to correct discrepancies in foreign prices, if American industry is to be afforded any adequate protection. To care for this condition, the American Valuation plan of assessing import duties is now before Congress. Under the depreciated currencies in many foreign countries, it is practically impossible to impose an ad valorem duty at a rate high enough to give the American manufacturer adequate protection against Germany, without making it prohibitive against other countries. If, on the other hand, we impose the duty upon the American wholesale value, all countries would be treated alike, regardless of their cost of production.

C. D. WAGENER.

American Valuation Association.

Radio Bulletins

The Journal of Electricity and Western Industry is sending out each week by radio-telephone a report on the outstanding engineering and industrial developments in the eleven western states, together with a concise review of business conditions in the principal cities in this district. The following excerpts are representative items taken from messages sent out.

At the request of a number of subscribers for this information, we wish to announce that 6XAC, the Los Altos station of the Colin B. Kennedy Company, which broadcasts the weekly news summary of the Journal of Electricity and Western Industry, operates with a wave length of 360 meters (as prescribed by Federal regulation) together with a 60-watt modulator and a 60-watt transmitter.

The Journal of Electricity and Western Industry wishes the many auditors who have been served by its weekly radio news and industrial reports success for the New Year. The eleven states of the West, especially those bordering on the Pacific Coast, are apparently entering a new era with the dawn of 1922. The events of the last few months portend rapid strides during the next twelve months.

Power companies during the coming year are planning to expend approximately $100,000,000 in the development of electricity. A supply of power for the industrial growth of the state is definitely assured. If the growth in population in the various communities of the West during the past year can be taken as a criterion, the new year will bring thousands of people to the farms and the cities and many hundreds of thousands of dollars to be invested in business, agriculture and industry.

The past year has witnessed the growth of radio telephony from the field of the amateur to a commercial status and the new year will see a further development of its commercial possibilities.

A few of the outstanding engineering and news developments of the past two weeks follow:

From Montana comes the report that the Anaconda Copper Company and the American Brass Company, the largest producer and user respectively of the red metal, are planning to consolidate.

Herbert Fleishhacker, president of the Anglo, London Paris National Bank of San Francisco and president of the Great Western Power Company, has returned from Washington with a plan to rehabilitate shipping on the Pacific Coast by the formation of a thirty million dollar ship combine operating all ships of the U. S. Shipping Board.

A revival of the iron industry in the San Francisco bay region is presaged in the announcement that after January first all foundries will operate on the American plan with a ten per cent reduction in wages.

J. D. Ross, superintendent of lighting of Seattle, has announced that a radio telephone system connecting Seattle with the Skagit River hydroelectric developments of that city, has been installed.

Station 6XAC of the Colin B. Kennedy Co., which sends out the news reports of the Journal of Electricity and Western Industry, has been heard in Washington, D. C., as the result of tests which were held recently.

A general review of business conditions throughout the West shows a definite tone of optimism despite the falling off of the holiday trade. Many retail lines have announced price reductions while stores are holding pre-inventory sales. Reduction of freight rates in many lines, including electrical apparatus, have been announced by the railroads. The past storms, while doing some damage, assure a definite water supply for irrigation and power during the next year. Industry is still quiet but there are rumors that plans are ready for increased activity in almost every line. Reorganization has been effected, plants overhauled, and markets studied during the period of quiet in preparation for a renewal of manufacturing activities.

Builders of the West

JAMES G. McDONALD, president of the McDonald Chocolate Company of Salt Lake City, was never shipwrecked on a tropical island. If, however, that had happened, had you gazed about the island a week or so after the gentleman was washed ashore, you would probably find that very quickly he had set up a sort of chocolate factory. He had found cocoa beans on the native trees which he beat into a powder. He had discovered canes that yield sugar. The combination of the two and the addition of some fruits yielded by the trees and bushes furnished a confection the like of which the shiny natives of the island had never tasted before. We would also find that he had banded the natives together who had selected leaders and made a collection of their finest native handiwork and the products of the island and staged an exposition to which the neighboring tribes were invited. Now all this is purely fanciful—but it is probably what would happen if fate should put this man in some strange part of the world some day. It's just about what he would do, because it is just what he has been doing for the greater part of his life.

JAMES G. McDONALD

President of the McDonald Chocolate Company of Salt Lake City, who is one of the leaders in business and community development of the Intermountain region.

Pioneering comes naturally to James G. McDonald since his parents were pioneers. The prospect of a trip on foot from the Missouri river to Salt Lake City did not hinder them from coming across the plains in the early days to make a fresh start in what had been pictured to them as a land of promise. It was a land of promise—for those who made it so, but it paid no dividends to the shirker.

Mr. McDonald received his early business training in a store conducted by his father and had small opportunity for schooling, as schools were not then what they are today in quality or number, but his education has been well rounded and intensely practical.

In his youth he determined to be a manufacturer and selected candy-making as his life work. From a little factory in the rear of his father's grocery store, his plant grew in a few years so that other buildings in the same block had to be leased. One used to enter the McDonald factory offices through an alley some five feet wide leading off Main street. Today it is one of the West's big institutions. The McDonald factory pioneered in many ways—an elaborate roof garden for the pleasure of its employes was one of these ventures. In those days sociology or welfare work was an untried experiment. There were plenty of Salt Lake businessmen who honestly wondered "what Jim McDonald is driving at now." In this roof garden—from which, by the way, the famous Roof Garden chocolates derive their name—there is a cafeteria, dance hall, player piano, phonograph, and aviary with the familiar McDonald parrot a scheduled featured specimen.

The goods he and his fellow-workmen made during his early days as a manufacturer were sold by McDonald himself. Mounted on a horse, with a small sample case strapped to his saddle, he rode about the sparsely settled Utah of those days and sold his wares. It would be hard to find a man who can tell a room full of young salesmen more about the psychology of salesmanship. Mr. McDonald is a many-sided man—a sportsman in business and afield, a man who has not been too busy to acquire a deeply religious and spiritual character, nor to carry into practice his moral and spiritual convictions. Nor has this man been so engrossed with his own success that he has been unwilling to put his shoulder to the wheel for the common good. As a director and for many years president of the Utah State Fair Board, Mr. McDonald was a powerful figure in promoting the interests of home industry in Utah in its every branch. Under his administration the Utah State Fair has developed from a very small annual display of agricultural and manufactured products into one of the West's most important expositions. Mr. McDonald has been and is identified with some of the largest institutions of Utah in addition to being the head of his own establishment. He puts the same energy into all of these that he displays as the leader of his own organization.

To James G. McDonald, then, for his application to the upbuilding of the community the same unselfish pioneering spirit which has distinguished his business career, this issue of the Journal of Electricity and Western Industry is affectionately dedicated.

Business Research — Its Necessity, Methods and Results

How the Business Depression of the Past Year has Demonstrated to the Business Man that Business Research Lies at the Base of Scientific Production and Distribution

By E. H. TUCKER
Economic Statistician, First National Bank of Los Angeles

BUSINESS depression has served to emphasize and bring into clear relief the evolutionary forces which are dominating business in the United States. The Nineteenth Century was the century of the pioneer, a period of lavish returns or of heavy losses. The successful development of a new country, new industry or a new business brought with it such returns that it was unnecessary to bother about wastes or petty economies. With the turn to the Twentieth Century the pioneer period had almost disappeared. The transcontinental railroad lines were laid, most of the agricultural country was either developed or in the process of development, and the lines of industrial development were more or less established. It is true that there is still much pioneer work being done in the West, but even this pioneering bears the stamp of the new era of business life.

The period of scientific business is superseding the period of pioneering. The business depression through which the United States has been recently passing has emphasized this change, through pointing out the need for scientific business knowledge as a basis for successful business programs. It has taught the cattle raiser of the Inter-mountain region that his price for cattle on the hoof must be affected by the ability of the citizens of Europe to purchase American-made shoes. The producer of power is coming to a definite knowledge that the consumption of power in the West is closely related to the absorptive powers of the Oriental markets. Large pioneering returns are giving way to small scientifically calculated margins of profits. What was formerly wasted has now come to be the margin between dividends and bankruptcy courts.

It is factors such as these that have brought business research to the forefront as a vital factor in business throughout the United States. The more scientific business becomes the more essential becomes the need for scientific data as a basis for business policies. It is the duty of the research organization to furnish this material.

Two Primary Channels of Research

The modern business man is primarily interested in two factors—the materials which he uses and the markets for the goods which he sells. In the manufacturing industry his interests lie in supplies of raw materials and in wholesale markets. In wholesaling his interests lie in supplies of manufactured goods and in the absorptive powers of retail markets. In retailing his interests lie in supplies of finished goods and trends of consumption and of consumptive markets. For this reason business research tends to run in two primary channels, serving the two main interests of the business man, be he producer of raw materials, manufacturer, jobber or retailer.

The first channel is that of tracing the supplies of raw materials and the second that of gaging absorptive powers of markets. With research organizations furnishing this knowledge, the business executive is in a position to determine policies, to outline the amounts of raw materials to be purchased, the period when they will be purchased, and their price trends. He is also in a position to estimate the amount of production which he can profitably market and the markets in which his goods can be sold. In other words, business research lies at the base of scientific production and distribution of goods.

The type of research material required by each individual business concern will, of course, vary with the particular phases of business activity in which that particular organization is interested. It is consequently impossible to lay down a general rule as to the types and sources of material to be gathered by all producers or distributors. Those concerns which are sufficiently large to absorb the overhead are establishing their own research departments, which are in a sense still pioneers in this new field and are establishing their own contacts and their own sources of information. Other businesses, not in a position to make the original investment or not sufficiently large to permit the savings resulting from such a department to offset the overhead of research organizations, must rely upon such data as is readily and conveniently available at comparatively small cost.

Three Types of Material Used

The research material used by the modern business research organization is of three important types. The first of these is the data already compiled, in available form, and capable of being used and interpreted with comparatively small effort. The second of these is that data which is already maintained but which has not been gathered together, correlated and compiled so as to be available for immediate use. The securing of this material required the expenditure of considerable time on the part of the research staff. The third, and probably the most difficult type of information to secure, is that which is necessary but which has never been prepared. To secure this data, original studies and investigations must be inaugurated, and staffs of trained specialists must be employed.

The procedure followed in building a research organization and the particular material gathered will, of course, vary with each business house and

will be dependent more or less upon the products handled and the general policies of the concern. The businesses which are in a position to maintain their own research organizations are, as a general rule, so large that their interests are more or less nation or world-wide and they consequently find it essential to use all available material with regard to world or national conditions in their own particular industry. The smaller organizations are apt to be dependent upon some particular research organization serving a large business or a large group of businesses, and must supplement the general data which they secure from such an organization with their own particular information with regard to their own businesses and their own localities.

Research Idea Will Grow

The supplies of business information are not so plentiful today as they will be in the future, for the trend of modern business toward more scientific business knowledge is just making itself felt and as this trend becomes more pronounced increasing amounts of accurate business information will be maintained in such form as to be available for interested parties. However, there is such a large mass of material already available that in many cases the mere compilation of this information will be sufficient to take care of the immediate research needs of business organizations. The United States Government and the various states are constantly preparing very important statistical data with regard to the trend of production in agriculture, mining, and industry and from time to time reports are available which deal with productive tendencies and are often compiled in such a manner as to show business trends in even such small political sub-divisions as counties and cities. Business is showing an ever-increasing tendency to exchange information and to maintain research organizations for compiling statistical material with regard to particular industries. Such information as that maintained by the National Association of Lumbermen and the American Petroleum Institute is of vital importance to those interested in the trend of production and sales in connection with these particular commodities. The information maintained by such research organizations within particular businesses is becoming increasingly important in American business. There is every indication that this new departure in American business life will continue to expand, and, as files of important statistical material are accumulated, perform increasingly valuable services.

Services of Bank Research Department

Probably one of the most important phases of the modern tendency for the gathering and compilation of business facts, is the inauguration of research departments in the banks of America. The banks of the country have been likened to the hub of the wheel of economic progress. They finance every business and every industry, and are vitally interested in the trend of production and consumption within industries which they are financing or are asked to finance. This requires an accurate knowledge of such things as the productivity of the locality in which they are located, of markets for the goods produced, of all possibilities for and practicability of new types of productive enterprises, and of prices and price trends.

It is absolutely essential that a bank in granting credit to a business man be thoroughly acquainted with the trend in that man's business and this information can be secured only through a research organization which is sufficiently broad in scope to have knowledge as to the general trend of business conditions and which is yet sufficiently specialized to have equally important knowledge with regard to the various important businesses in the district in which the bank is operating. Consequently the bank research department is becoming increasingly important to the business organizations which are not in a position to maintain their own highly trained and specialized research men, by furnishing them with reliable information.

Once the type of information desired and the sources of it have been determined, the research department cannot attempt to function as a vital factor in business management until the methods of presenting the data gathered have been definitely determined. When a business maintains its own research organization it must, of course, determine upon methods of presentation which will be the most readily understood and the most beneficial within that particular organization.

Forms of Presentation

As a general proposition, however, statistical material is presented in one of three forms: either by chart, by table, or by straight reading material. Often the three methods are combined and each method has its own particular advantage for particular data and for certain types of business men. Upon the whole the chart method, properly interpreted by statements accompanying the chart, is gaining in favor, because of its readability. Ordinarily the chart is capable of showing a trend or a tendency and making the point desired much more easily than mere tables or ordinary reading matter.

This material when properly compiled is, of course, of comparatively small importance unless it can be properly applied and the application must come in the executive offices of the particular business desiring to use the information. Once an organization has gathered together data with regard to the trend of productivity, the trend of prices and the trend of markets, in addition to its better knowledge of external factors affecting production and distribution, it has acquired a means of checking its own internal progress. It may parallel this external data with similar data with regard to its own particular organization and thereby show clearly wherein the business is keeping pace with, going ahead of, or falling behind the general trend in the industry. From this information the executives may draw reliable conclusions as to the places where the concern is strongest and weakest and as to the policies which must be followed in continuing production or distribution of goods.

Difficulties of Transportation to Mountain Power Projects

Kerckhoff Development of San Joaquin Light and Power Corporation Finished in Record Time by Ingenuity and Daring of Engineers in Handling and Forwarding Materials

By REX C. STARR
Construction Engineer, San Joaquin Light and Power Corporation

THE location of hydroelectric projects is a matter that is predetermined by the elements entering into the development, and the ways and means to reach the combination of elements making the development possible often test the ingenuity of man. Many ideal power sites remain undeveloped because of locations considered inaccessible. Any information on transportation problems may hasten the development of many of these inaccessible power sites.

The following account of the transportation problems incidental to the construction of the Kerckhoff project of the San Joaquin Light and Power Corporation, should give some idea of the achievement accomplished and methods used. The Kerckhoff development is located on the San Joaquin river, 45 miles northeast of Fresno and four miles from the nearest railroad point at Auberry, where the San Joaquin & Eastern Railway has terminal facilities.

The first party of construction engineers to move in on the job, May 10, 1919, found only wilderness between Auberry and the damsite. Without so much as running a line to determine the levels, teams were put to work on a road over the mountains, plowing and grading behind pioneers, who cut away the timber and blasted the rock. Sixty days' feverish work brought the road to the canyon side, where a clearing was made for a supply dump and hoist house. A power line run parallel to the road and tapped at points, furnished power to operate a portable air compressor, which was used in drilling rock for blasting. The road winds around mountains and skirts ravines, ending on the brink of the San Joaquin River Canyon 1100 ft. above the river bed and one-half mile from the big construction work.

The road completed, the next job was to get materials and men down the 1100 ft. to the damsite. The plans called for a 3700-ft. incline cable tram, the construction of which would require several weeks' time. Speed was required, and time was limited, so it was decided to begin operations at once on the foundation while the construction of the incline cableway was in progress. Both skill and daring were required in the work of transporting materials down a mountain side having grades of 100 per cent, yet this feat stands out as a prominent factor that made possible the completion of the Kerckhoff dam in seven months' time.

Down this rough and steep trail materials and men were transported that saved more than one month's time in the preliminary work of building the tunnel and dam of the Kerckhoff project of the San Joaquin Light & Power Corporation. An incline railway was later installed at this point.

Diamond drills, air compressors, and camp supplies for 100 men were lowered by means of sleds built up of lumber that was later used in construction work. These sleds were drawn by mules and snubbed from the rear by lines hitched to trees along the pathway. Timbers for a bridge 300 ft. in length and 65 ft. high, and compressor units weighing 14,000 lb., were let down the canyon sides in this way.

With the opening of over four miles of mountain road and the installation of the tramway and hoist, the movement of materials began in earnest. While the road was passable, it was far from completed and required a large crew of men to get it into shape for the heavy trucks carrying cement, lumber and machinery. The material for the dam was hauled with three 5-ton and seven 2-ton trucks which cut the roadway into deep ruts that were smoothed out as quickly as it was possible to work men and road machinery between trips and at night. Water for the sprinkling and also to supply the main camp at Auberry was pumped from the San Joaquin river through a line laid along the road. Two trucks equipped with sprinklers operated at night. Materials were delivered at the end of the road to the head of the incline, where plat-

forms were built for storage, to obviate waiting for the incline cars.

Cableways Across Canyon

As material was delivered to the foot of the incline, it was placed at points where needed on the dam by means of two cableways anchored across the canyon, each having a capacity of ten tons, so arranged that a complete load on the incline car could be picked up and delivered to any part of the

Six transformer tanks being hauled in one train of six trailers by the Holt Caterpillar. The heaviest units were hauled in by this tractor, at the cost of about sixteen cents per ton mile.

work. The work of loading the trucks at Auberry was handled by cranes placed conveniently near sidings and storage platforms. The materials were forwarded as rapidly as the construction crews could handle them, and no opportunity was lost to load direct from the car to trucks.

An additional nine miles of road was constructed to points of approach for tunnel adits and to reach the power house camp. These roads were of the same character as required for the dam construction with the advantage of a down-grade haul for 90 per cent of the distance. The maximum up-grade to the power house camp is 6 per cent, while the maximum down-grade is 12 per cent. The road to the power house was kept in condition by sprinkling and dragging with a curved edge drag to give a slight crown to the road.

Road to Power House

The power house is located in a box canyon, and 400 ft. below the only available space which could be used for storage. It was, therefore, necessary to install an incline railway for transportation from storage yard to power house site. This incline is 1000 ft. long and has a maximum grade of 100 per cent as it enters the building. A 7/8-in. cable is used and hoist equipped with 150-hp. slip-ring induction motor. A 15-ton derrick was installed between the track and road for transferring material and equipment from trucks and trailers to the incline cars.

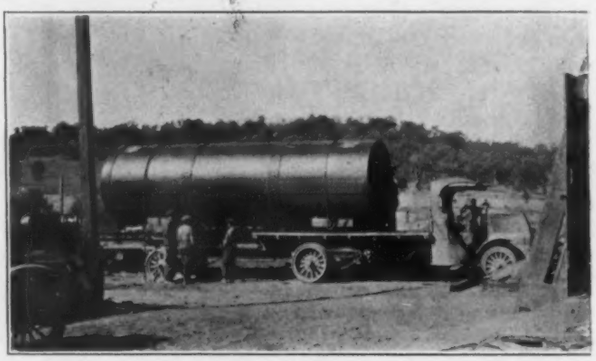
The heaviest units entering into the development were taken over this power house road by means of a 75-hp. Holt Caterpillar, drawing a 30-ton four-wheel trailer. The road stood up well under heavy loads of 29 tons. Lighter loads were handled by trucks and by means of 10-ton trailers. Additional transportation equipment was placed on the work as required until the peak of the load required the following: one 75-hp. Holt Caterpillar, one 45-hp. Holt Caterpillar, one 30-ton trailer, six 10-ton trailers, two 15-ton horse-drawn wagons, four 5-ton two-wheel trailers, three 5-ton Mack trucks, one 5-ton Pierce Arrow truck, one 5-ton White truck, one 2-ton Mack truck, four 2-ton White trucks, two Dodge commercial cars, and nine light service cars.

Cement was the most important material to be transported because of the constant need for it, and the great aggregate weight of the material required. Lumber was a close second in tonnage hauled, averaging four pounds to the board foot because of the large content of moisture in the green lumber, most of which came direct from the sawmills.

A summary of the total tonnage hauled for the Kerckhoff development, exclusive of transportation of men and work of light service cars, shows the following:

Cement, 161,623 sacks	8,081 tons
Rail	646 tons
Lumber, 3,818,200 ft.	7,636 tons
Explosives, 1,280,300 lb.	640 tons
Equipment and supplies, 9,911,902 lb.	4,956 tons
Power house equipment	329 tons
Penstock	709 tons
Subsistence	1,622 tons
Salvage haul of equipment, rails, pipe, lumber and supplies	3,196 tons
	27,815 tons

The heaviest pieces hauled were the generator rotors, weighing 29 tons each. These were transferred from the car to the 30-ton trailer and hauled by the 75-hp. Holt Caterpillar to the power house, requiring a half-day's time for each piece. Cement was also hauled on 10-ton trailers loading three in



Section of penstock being hauled to head of incline on Kerckhoff development. The cost of trucking averaged thirty-one to thirty-five cents per ton mile. On account of the necessity for speed, trucks were used wherever possible.

a train behind the 75-hp. Holt. At one time six transformer tanks were hauled in one train of six trailers. During the rush hours of completing the big job, one thousand tons of material were hauled in seven days from Auberry to the power house.

The cost per ton mile for hauling with trucks was 31c. to 35c., as against about 16c. by tractor. The element of speed, however, made necessary the more rapid truck transportation wherever possible.

Changes in the Mechanism of Distribution Now Under Way

A Survey of the Present Distributive System and a Discussion of How It Has Been Affected by Conditions Arising from the Pressure of Increased Commodity Prices

By E. A. KINCAID
Instructor in Economics, University of California

FROM the beginning of what may be called the Rooseveltian period up to the present time our institutions of all sorts have been subjected to much criticism. Both economic and political institutions have come in for a large measure of critical discussion and among the former institutions none has received less of constructive criticism than the marketing system. Much of what has been said said about the marketing system is not worthy of serious consideration since it has been nothing more than fault finding without the support of reliable data for such charges as have been definitely stated.

The whole of the period under consideration has been marked with the pressure of rising prices. There has resulted from this an increased burden on our economic institutions which is the immediate result of an effort to make them perform the old service more economically and thus in some measure to offset rising prices. Our economic institutions have not responded freely to the changed conditions and this is particularly true of the distributive system. Consumers have sought to preserve their standards of living in the face of rising prices. With every reduction in the standard of living there has come a renewed attack upon the distributive system. Dissatisfaction has not been confined to the consumers. Producers, including both manufacturers and agriculturalists, have had much to say against our marketing system. They assert that they have not been able to get efficient access to markets and the distributive system has been maligned from both sides.

Attitude of the Farmers

It has never been difficult to arouse the opposition of the farmer against the marketing mechanism of the country, largely because farmers as a class have very little contact with the system. They deliver their products to country stores, to local buyers and to car-lot shippers and their knowledge of the process of distribution stops there. Farmers have been influenced by the discussion about the thirty-five cent dollar which many critics of the marketing system have dwelt upon. It is true that the final allocation of the several portions of the consumer's dollar sometimes leaves the farmer but thirty-five cents, but it is also true that for many products the farmer receives much more. While the process of prorating the consumer's dollar has been hastily stated on the basis of thirty-five cents for the farmer and sixty-five cents for the middleman, and this relationship has been applied to all products indiscriminately, the fact remains that talk of this character has been altogether too free, particularly so because it is not possible to show that the farmer, on the average, receives but thirty-five cents of the consumer's dollar. In fact it is not possible to show with accuracy just what portion of the consumer's dollar does go to the farmer, for there is a great absence of data upon which to base a statement.

Quite regardless of this fact, farmers have generally accepted the criticisms of the marketing system as just. They have been influenced to adopt this attitude by the course of recent events. Since May, 1920, prices have been declining except for the very recent check in the movement. In the process of readjustment which changed economic conditions have compelled, the prices of farm products have shown the most ready response. They are nearer to the pre-war level than the prices of most of the products which the farmer has to buy. This maladjustment has meant a high cost of living for the farmer, means of escape from which are not yet apparent. Buying high-priced clothing and building materials with low-priced wheat and cotton is certain to produce a critical and questioning attitude on the part of the farmer.

Much of the explanation for the maladjustment of prices is believed to be found in the marketing system. At any rate the members of Congress who have formed the "agricultural bloc" have apparently accepted this point of view. Under the pressure exerted from their constituents members of Congress from the great agricultural states have formed a bi-partisan organization which has functioned most effectively up to the present time.

The efforts of the farmers to get at the marketing system has not ended with legislation. The cooperative movement has been given a great stimulus. Farmers have been urged to adopt cooperation as the solution of the marketing problem. Cooperation, when properly organized and efficiently managed, can be made to render excellent service to growers, but it is not a cure-all and it is certainly not an automatic remedy. It works well only when given much highly trained administration and where growers have learned to stand back of their organizations.

Attitude of the Manufacturer

The dissatisfaction of the manufacturer with the marketing system has taken quite a different form. He has shown a disposition to go around or over the head of the middleman. Many industries have reached a high state of efficiency with the aid of the expert marketing facilities of middlemen, only to abandon them. Such is the nature of the charge against Proctor & Gamble as the result of their decision to extend the same quantity discounts to retailers that were formerly extended to wholesalers alone. This move was looked upon as a powerful attack upon the jobber, the key-stone in the orthodox

system of distribution. The ability of the manufacturer to go around wholesale middlemen or to dictate terms in event his services are used, is the result of nation-wide advertising campaigns on the part of the manufacturer. He has expended vast sums in building up a demand for his products and he does not like to see the jobber substitute his trade-marked lines for those so effectively advertised. Selling direct to the retailer is one way around this difficulty.

The disposition of manufacturers to go around the jobber may well be described as a tendency. Some manufacturers have tried it and then returned to the jobber form of distribution, but there is still a tendency to experiment with a system of distribution which is independent of the jobber. For this situation jobbers are largely to blame. They have placed their own trade-marked lines directly in competition with those of manufacturers and the latter has come to feel that the jobber's lines are pushed and his own are held back. The jobber has replied that he has been forced to this method of business because manufacturers have gone into the jobbing business. The manufacturer demands efficient distribution of products which he has highly advertised. He cannot leave his access to markets entirely in the hands of the jobber who shows no disposition to confine himself to his proper field. Thus the argument runs back and forth and meanwhile there is a good deal of chaos in the distributive mechanism. So much, in fact, that one hesitates to use the word system as truly descriptive of it. Some very well informed jobbers have suggested that the way out of this difficulty is to be found in strict adherence by the jobber to his true economic function. It is certainly true that no more efficient system of distribution exists than that through the jobber where he confines himself strictly to the jobbing business.

The position of the middleman has been endangered by the invasion of the field of distribution by the great meat packing industry. These great industrial organizations have perfected a system of distribution for their immediate products, but they have not stopped there. The very existence of an efficient distributive organization for meat and meat products has made it desirable for the packers to handle certain closely related lines. This tendency to expand much aroused the fears of the wholesale grocers and they succeeded in having it checked by what was known as the Packer Consent Decree. Recently there has been an effort to have the Decree relaxed somewhat so that the Packers might expand their field of operations and hearings are now in progress before an inter-departmental commission at Washington to bring out the facts. Independent middlemen feel that the low cost per unit which the Packer distribution will involve will be sufficient to drive them out of business and thus to still further modify the present system of distribution.

The distributive system has been seriously affected by the growth of chain stores, department stores and mail order houses. Fear of the last two has largely subsided though it cannot be said that they are regarded with favor by jobbers and retailers of the old line. The chain store, however, is a new and growing menace the possibilities of which are not yet fully known. While the chain store movement has shown a tendency to over-expansion, it possesses inherent economic advantages which are likely to make it permanent. Thus the old-time distributive system has been permanently modified in another direction.

Open-price Associations

The marketing system has been menaced by other factors and some of these may be summarized under the phrase "unfair competition." The devices to restrain or temper competition have been numerous and varied. The most recent one to be tried is known as the open-price association. It has been said that open-price associations ramify the whole business system of the country and that they are responsible for high prices. Whether or not this charge is true the fact remains that the mere existence of such organizations has caused the middleman to be looked upon with suspicion. It has been said on high authority that the open-price association has been the chief cause of the wide divergence of retail and wholesale prices. A distributive system that is under attack from several sides and that is obviously undergoing serious modification cannot afford to be regarded with suspicion. It is, therefore, fortunate that the Supreme Court recently found the open-price association in violation of the Sherman Law. The court took the stand that the associations made competition ineffective and it must follow that the court very properly reached its decision if the charge is correct. Competition is the very essence of our economic system. Business men of vision must surely recognize that the alternative to competitive fixing of price is either monopoly or government regulated by commission. Where monopoly exists commission regulation tends to come about and that was just the reason why the farmers demanded legislation regulative of the Packers. Regulation by commission is government invasion of the field of business. It is fraught with great consequences for the failure of regulation leads on to government ownership or operation or both. Thus we arrive at state socialism. Hence the statement that business men of vision will not encourage organizations which are formed for the purpose of restricting competition. The decision of the Supreme Court concerning the open-price association must therefore be welcomed since it was generally held to be a device for restricting competition.

A survey of the present distributive mechanism must take account of all the various subjects which have here been considered as well as others which cannot be discussed in this article. Enough has been said to indicate that far-reaching changes in the mechanism of distribution are under way. Just what they will come to cannot now be said. It is likely that the old type of distribution from producer to jobber to retailer to consumer will be materially modified but it is improbable that it will be entirely done away with. It has inherent virtues which, if realized, should preserve it.

Use of Artificial Daylighting in Industry and Commerce

The Demands for and the Requirements of Artificial Daylight in Industrial Processes and in Stores, Especially where Accurate Color Matching is Required are Many and Varied

By G. H. STICKNEY
Edison Lamp Works

THOUGH much has recently been said and written about the use of artificial daylight in commercial and industrial fields, there are still many people today who are unacquainted with the features of lighting which make for especial accuracy in industrial processes. Often the fundamental requirements in artificial lighting for accurate color matching and color discrimination are unknown. Even when the fundamentals are known we often find either that equipment in use is inadequate or that proper equipment is wrongly applied. With a view to clearing up some of the misunderstanding which now exists, a general review of the subject will not be out of place. For most purposes light emitted from ordinary incandescent lamps is of a color which is artistically pleasing and suitable. However, in certain instances it is most important that colored materials be manufactured, inspected, and sold under a light more closely approximating daylight in color than that produced by ordinary lamps.

Daylight is complex and varies widely in color and intensity because of the different degrees to which the earth's atmosphere modifies it. Water, clouds, dust, and vapor in the atmosphere; the color of reflecting surfaces; the position of the sun; and many other contributing factors give us a combination of direct filtered sunlight and skylight and cause considerable variation in the character of daylight. Light from the north sky, from which direct sunlight is always absent, has invariably been preferred for accurate color matching because it is subject to less variation than other natural light. Artificial lighting of even a more accurate color standard than north skylight can be and has been produced, but as it is expensive, it is impractical except where the areas to be lighted are small or where the demand for accuracy is great.

Commercial Uses

With few exceptions, greater care is taken to maintain high standards of accuracy in the industrial field than in the commercial field. The location and interior furnishings of the establishment in which goods are sold generally so affect and modify the daylight which penetrates an interior, that accuracy in color matching is impossible. Indeed, the very fact that but few attempts have been made to remedy this condition shows that store managers do not appreciate to the same degree as manufacturers, the value and importance of this feature. In general, demands for efficient light greatly surpass demands for highly accurate light in commercial and industrial interiors.

By passing light from an illuminant through a glass so colored as to absorb part of the radiations which are in excess, it is possible to produce approximately the same balance of light rays as exist in daylight. The ever increasing demand for light of a more efficient degree of color modification than that produced by ordinary incandescent lamps led to the development of the Daylight Mazda Lamp. This lamp is constructed in a scientifically determined bulb of special blue glass which cuts out some of the red and yellow rays of ordinary incandescent light and produces a light which is a fairly close approximation of daylight. In spite of the distinct advertising

Simulating daylight conditions by means of artificial daylighting in the millinery department of Livingston Bros. department store facilitates rapid selection of merchandise. There is no waste of time in endeavoring to explain what a color is like, the most delicate shades being distinguishable.

Many stores today are using accurate color matching units of the counter and suspension type in conjunction with lamps for general lighting. These do away with the inconvenience which formerly existed when the customer had to carry his purchase to a door or window to verify its exact colors.

value of artificial daylight in the modern store, it is doubtful whether Daylight Mazda lamps will ever supplant regular Mazda "C" lamps for general store lighting. As mentioned before, goods designed and intended for use under average night illumination should naturally be displayed under light from ordinary Mazda "C" lamps. Consequently, the only departments really requiring general lighting that approaches daylight are those that handle clothing, materials and articles to be worn or used out-of-doors. A show window equipped with Daylight Mazda lamps stands out prominently because of the marked contrast between the white light emitted from these lamps and the surrounding yellowish light. Further, window displays of men's clothing, furs, or hats, are shown best under light from these lamps. Though not universally applicable, the Daylight Mazda is entirely suited for window lighting in certain instances.

The daylight quality of artificial light makes possible the quick perception of fine filament wire and the rapid and accurate setting of filament forms in the marking and forming department of the Oakland, California, Mazda Lamp factory of the General Electric Company.

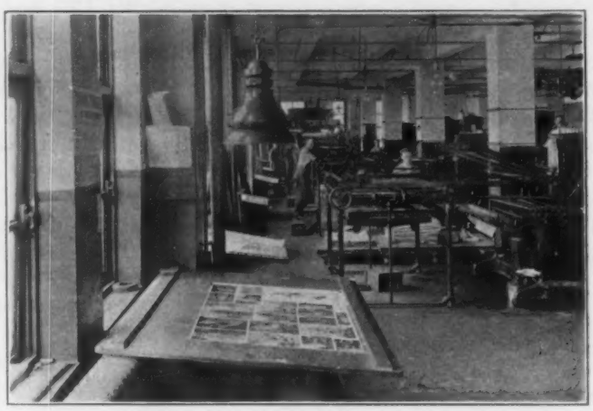
Industrial Uses

The uses for artificial daylight in industry are wide and varied, but not difficult to detect. It is an interesting fact that greater speed and accuracy invariably result in the manufacture and grading of colored goods when light of daylight quality is provided. Many textile mills have installed Daylight Mazda lamps over looms, in order to insure the use of thread of the correct color in the shuttles, as well as in the warp. In laundries, light from these lamps enables operators on the folding and inspection tables to detect spots that, under the yellowish light from clear lamps, tend to merge into a white background. Daylight lamps have proved valuable in mines in the West in grading ores, difficult to separate because of similarity in color. In the testing laboratories of chemical manufacturers, Daylight Mazda lamps have given satisfactory service. They have been of great use in sugar refineries, for grading different refined sugars. Some manufacturers of photographic supplies find the light from Daylight Mazda lamps useful for examining the color and quality of prints. In printing plants, where it is essential that colors be shown in their correct relation, Daylight Mazda lamps have been used.

In addition to the industries mentioned, modified light has proved a great help in cigar factories, where cigars are graded according to shade; in oil refineries, where the different grades of oil are determined; in jewelry establishments, where pearls, diamonds and other precious stones are critically examined, and in miscellaneous places about flour mills, button factories, potteries, and paint factories.

The few examples given indicate the broad general fields for the application of artificial daylight. Needless to say, there are thousands of instances where the accurate type of color identification unit is of distinct service. Small areas lighted to a high intensity give a means of insuring uniform quality of product either by constant or periodical inspection. In this field might be mentioned dye manufacturers, cotton brokers, silk, cotton and woolen mills, ribbon factories, bleacheries, lithographing plants, dental supply factories, chemical works, jewelry factories, button, paint, paper and other industrial plants too numerous to mention.

A growing use for artificial daylight touching everyone is in the home. It is true that the somewhat cold light produced by Daylight Mazda lamps does not recommend it to the average individual for general artistic effects. In the kitchen, however, light of this quality is of distinct assistance in preparing sanitary food and has been widely applied.

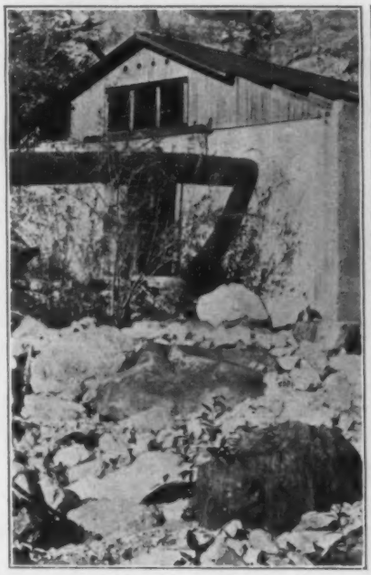


A Macbeth Color Identification lamp over an examining table in the color press room of a commercial printing establishment, where accurate matching and comparison of colors is absolutely essential. Increased production, reduced color troubles, elimination of eye difficulties, and elimination of hurry during daylight hours is the result.

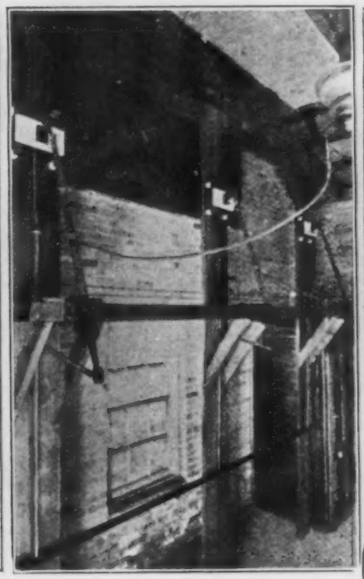
An excellent portable lamp for the living room is so designed as to completely hide the light source from view and to emit a majority of the light at an angle producing a maximum illumination on vertical surfaces. This is equipped with an accurate type of color modifying plate. The quality of illumination thus produced is remarkably pleasing for reading and sewing. Observation has convinced the writer that, as a reading lamp, such a unit has very marked advantages and surprisingly little eye fatigue results with long periods of close application.

World Records of the West—From 10,000-v. to 220,000-v.

One of a Pictorial Series Featuring Interesting Applications of Electric Service, Advances in Home, Industrial and Power Construction and Noteworthy Developments in Western Progress



Previous to the erection of the Pomona line in 1891, sending 10,000 volts a distance of 20 miles, it was thought that electricity could be used only within a small radius of the spot where it was generated. This California experiment ranks as the first record.



High tension switches on the 40,000-v. Provo-Mercur line of Utah, which for many years ranked as the world's highest voltage. In 1896 a noted scientist wrote an article for this paper prophesying 60,000-v. as the physical limit of high voltage transmission.

The upper limit of high voltage was again broken a few years later when the 70,000-v. Colgate line was brought 200 miles into San Francisco by the Bay Counties Power Company. Another record was established by this line in the long span of Carquinez Crossing.

Until 1921, the 150,000-v. Big Creek line of the Southern California Edison Company held the record for high voltage transmission. This is the highest actual operating voltage at the present time, other lines of higher voltage being now under construction.

The 165,000-v. line of the Great Western Power Company from the Caribou plant is now operating at 15,000 v., but is soon to carry the higher voltage for which it was designed. For a short time it will hold the world's record in transmission achievement.

Since the early experiment of 1891, long-distance transmission of power has revolutionized western industry and agriculture. The newest record is the 220,000-v. Pacific Gas and Electric Pit River line which is to be put into operation during this summer.

SOME WESTERN HYDROELECTRIC PROJECTS UNDER

Prepared by the Journal of Electricity and Western Industry in

Company	Name of Plant	Location	Dam and Reservoir	Tunnels	Maker of Water Wheels	Penstocks
Bridge River Power Co.	Bridge River Plant	120 mi. from Vancouver, B. C.	Simple concrete arch 157′ high. Capacity 1,250,000 acre-ft.	Two 12,800′ long, 12½x14′ concrete lined, 1,500 sec.-ft. flow	Not awarded	Eight, dividing into 16 at Power house 78″ to 50″ dias.
British Columbia Electric Railway Company	Fourth Unit Stave Lake Plant	40 mi. E. of Vancouver, B. C.			Escher Wyss Co.	One riveted steel line, 14½′ dia., 170′ long.
City of Seattle	Newhalem Plant	100 mi. N. E. of Seattle, Wash.	Small diversion dam on Newhalem Creek	Length 2,675′ under 266′ pressure at lower end	Pelton Water Wheel Co.	One electrically-welded line, 1,122′ long, 33″ to 30″ dias.
City of Seattle	Gorge Creek Plant	100 mi. N. E. of Seattle, Wash.	240′ high	Two 11,000′ long	Not awarded	Three 1,000′ long, 11′ to 10′ dias.
City of Seattle	Ruby Creek Plant	100 mi. N. E. of Seattle, Wash.	450′ high, 1,000,000 acre-ft. storage.	Length 17,000′	Not awarded	
Washington Water Power Company	Spokane Upper Falls	In Spokane	Inclined slab and buttresses 30′ high	None	I. P. Morris	One 370′ long. Reinforced concrete, 18′ dia.
Idaho Power Company	Shoshone Falls Plant	Near Twin Falls, Idaho	Concrete diversion dam 20′ high	Length 450′, 10½ x 10½′, 800 sec.-ft. flow, concrete lined	S.Morgan Smith	One riveted steel line, 172′ long, 10′ dia. top.
City of Tacoma	Lake Cushman Project	About 60 mi. W. of Tacoma	Gravity arch 210′ high, 150,000 acre-ft. storage	Length 5,300′, 14x20′, 700 sec.-ft. flow, concrete lined	Not awarded	Two initial, four ultimate, 3,200′ long, 80″ to 48″ dias.
Utah Power and Light Company	Olmsted Plant	50 mi. S. of Salt Lake City			I. P. Morris	One riveted steel line 798′ long, 6′ dia.
Northwestern Electric Company	Underwood Plant	On White Salmon River	Gravity concrete dam 62½′ high			Two concrete lines 133′ long, 10′ dia.
Portland Railway, Light and Power Company	Oak Grove	55 mi. from Portland	Earth fill 22′ high	8½-mile conduit		
Pacific Gas and Electric Company	Spring Gap	Middle Fork Stanislaus River	Rock fill dam 135′ high, 17,900 acre-ft.	4.7 mi. canal, 50 sec.-ft. flow	Pelton Water Wheel Co.	One riveted steel line 7,253′ long, 36″ to 30″ dias.
Pacific Gas and Electric Company	Drum Plant Unit No. 3	Bear River Placer County			Pelton Water Wheel Co.	
Pacific Gas and Electric Company	Hat Creek No. 1	Hat Creek, 245 mi. N. of San Francisco	Small timber crib diversion dam	Half-mile canal, 600 sec.-ft. flow	Wellman Seaver Morgan	One riveted steel line 1,605′ long, 10′ to 8′ dias.
Pacific Gas and Electric Company	Hat Creek No. 2	245 mi. N. of San Francisco	Small timber crib diversion dam	4,500′ of flume, 800 sec.-ft. flow	Wellman Seaver Morgan	One riveted steel line 413′ long, 10′ to 8′ dias.
Pacific Gas and Electric Company	Pit River No. 1	245 mi. N. of San Francisco	Diversion weir	Length, 10,160′; 14′ dia.; concrete lined, 1,800 sec.-ft.	Allis-Chalmers	Two riveted steel and lap-welded lines 1,372′ long, 10¾′ to 8′ dias.
Pacific Gas and Electric Company	Pit River No. 2	Shasta County, California.				
Great Western Power Company	Caribou Plant	195 mi. from San Francisco on Feather River		20,400′ of tunnel, 7x7′ to 10′ circular	Allis-Chalmers	Two riveted steel lines 2,082′ long, 66″ to 42″ dias.
City of San Francisco	Moccasin Creek Plant	140 mi. E. of San Francisco	Hetch Hetchy dam 226′ high, 20,600 acre-ft. Earth forebay dam 145′ high, 2,400 acre-ft.	18 miles of 10x13 ft. tunnel, 620 sec.-ft. capacity	Not awarded	Three lines 4,700′ long, 104″ to 52″ dias.
Turlock and Modesto Irrigation Districts	Don Pedro Plant	Tuolumne River above Lagrange	Gravity concrete dam 283′ high, 270,000 acre-ft. storage	Power house monolithic with dam	S.Morgan Smith	Three reinforced concrete tubes in dam 200′ long, 6′ dia.
San Joaquin Light and Power Corporation	Balch Power House	Kings River	Multiple arch, 150′ high, 45,000 acre-ft. storage	Length 27,000′, 12′ dia., unlined, 400 sec.-ft. flow	Not awarded	Four lap-welded lines 5,425′ long, 48″ to 24″ dias.
San Joaquin Light and Power Corporation	Kern Canyon Plant	18 mi. N. E. of Bakersfield	Diversion dam 15′ high at tailrace of Kern River No. 1	Length 8,300′, 11′ circular, 800 sec.-ft. flow	Allis-Chalmers	One riveted steel line 568′ long, 8′ to 7′ dias.
Southern California Edison Company	Kern River No. 3	130 mi. from Los Angeles	Concrete diversion dam 25′ high	12 mi. 8x8½ ft., chiefly lined with concrete, 600 sec.-ft. flow	Pelton Water Wheel Co.	Two rivcted and welded steel lines 2,520′ long, 7′ to 5′ dias.
Southern California Edison Company	Big Creek No. 8	241 mi. from Los Angeles	Concrete diversion dam 60′ high	Length 5,600′, 20x20′, unlined, 2,050 sec.-ft. flow	I. P. Morris Co.	One riveted and welded steel line 2,700′ long, 8′ to 6′ dias.
Southern California Edison Company	Big Creek No. 3	235 mi. from Los Angeles	Small diversion dam	Length 30,000′, 21x21′, 3,000 sec.-ft. flow	Not awarded	
Sespe Light and Power Company	Santa Paula Project	Sespe Creek, Ventura County, California	Six multiple arch dams 115 to 245′ high			
City of Los Angeles	Franklin Canyon Plant	On Los Angeles Aqueduct	Earth dam 50′ high	Penstock from tunnel direct	S.Morgan Smith	6,250′ long, 52″ dia. top and bottom
The Southern Sierras Power Company	Forest Home	Mill Creek				
The Southern Sierras Power Company	Leevining No. 1	Leevining Creek				

*Preliminary and subject to change.

WAY IN 1921 OR DEFINITELY SCHEDULED FOR 1922

collaboration with Electrical World and Engineering News Record.

Prime Movers	Static Head Feet	Transmission Lines		Generators		Present Stage of Development	Ultimate Capacity of Plant, kw.
		Length and Voltage	Type—No. of Circuits	Number Rating	Make and Voltage		
16-25,000 hp. double overhung impulse units	1,200	130 mi. of 150,000-volt steel tower line	2 steel towers	16—20,800 kva.	6,600 volts	Project started middle of 1920	
One 13,000 hp. Francis turbine	110	66,000 volts		1—8,825 kva.	Can. G. E. 4,400 volts	To be in service March 1, 1922	35,400
One double overhung impulse unit	510			1—2,200 kw.		Completed in summer of 1921	
Six 30,000 kva. units	395	165,000-volt line 100 mi. long				Preliminary work under way. 11,000′ tunnel contract let	180,000
Six 45,000 kva. units	470 to 720					Gorge plant to be completed in 1923	270,000
One 14,250 hp. vertical reaction turbine	64	Distributed from plant 4,200 volts	One-distribution circuit	1—11,750 kva.	G. E. Co. 4,200 volts	Completed May 1, 1921	10,000
One 14,500 hp. Francis turbine	204	44,000 volts	3 wood poles	1—10,000 kw.	West. Elec. 6,600 volts	Headworks partially completed in 1921	11,100
(Initial) Two 22,500 hp. units	590	100,000-volt line 38.4 mi. long	2 H-frame wood poles	2—16,000 kw.	6,600 volts	Real estate and right acquired. Surveys and test borings under way	56,000
One 7,700 hp. vertical reaction unit	340	Previously built		1—5,500 kw.	G. E. Co. 2,300 volts		
Two 4,200 hp. vertical reaction units	60	One mile 66,000-volt tie line	1 wood pole	2—3,000 kw.	2,300 volts	Final surveys completed	6,000
One 27,500 hp. reaction turbine	860			1—20,000 kw.		To be completed in 1924	
One 9,500 hp. single overhung impulse wheel	1,865	104,000-volt line 15 mi. long	1 H-frame wood pole	1—7,500 kva.	G. E. Co. 6,600 volts	In service	7,000
One 20,000 hp. double overhung impulse unit	1,375			1—15,000 kva.	West. Elec. 6,600 volts	In course of installation	12,000
One 15,000 hp. vertical reaction turbine	217	220,000-volt (ultimate) 202 mi.	1 wood pole	1—12,500 kva.	G. E. Co. 6,600 volts	In service	10,000
One 15,000 hp. vertical reaction turbine	198	220,000-volt (ultimate) 202 mi.	1 wood pole	1—12,500 kva.	G. E. Co. 6,600 volts	In service	10,000
Two 40,000 hp. vertical reaction turbines	440.5	220,000-volt (ultimate) 202 mi.	2 steel towers	2—35,000 kva.	Allis-Chalmers 11,000 volts	To be completed in 1922	63,000
	115	220,000-volt (ultimate)				*To be begun by June, 1922	20,000
Two 30,000 hp. double overhung impulse wheels	1,008	165,000-volt line 182 mi. long	1 steel tower	2—22,223 kva.	G. E. Co. 11,000 volts	Completed summer of 1921	120,000
Three or four 25,000 hp. double runner impulse wheels	1,325	154,000-volt line 143 mi. long	2 steel towers	3 or 4—20,000 kva.	11,000 volts	Construction under way. Plant to be completed in 1923. Equipment contracts not yet awarded.	150,000
Three 6,700 hp. reaction turbines	160 to 240	About 110 mi., 66,000-volt		3—5,000 kw.	G. E. Co. 6,600 volts	Started June 1921	70,000
Two 44,000 hp. impulse wheels	2,495	110,000-volt line, 32 mi. long	2 steel towers	2—31,000 kw.		Construction to start April, 1922	108,500
One 12,000 hp. vertical Francis turbine	230	66,000-volt line previously built	Wood pole	1—10,600 kva.	Allis-Chalmers 11,000 volts	In service summer of 1921	18,000
Two 22,500 hp. single runner vertical reaction turbines	806	75,000-volt line, 45 mi. long	2 steel towers and wood poles	2—17,500 kva.	G. E. Co. 11,000 volts	In service summer of 1921	32,000
One 30,000 hp. vertical reaction turbine	729	Two miles 150,000 to 220,000-volt tie line	2 steel towers	1—22,500 kw.	G. E. Co. 11,000 volts	In service Aug., 1921	135,000
Three 35,000 hp. units	825	One mile 220,000-volt tie line	2 steel towers	3—25,000 kw.		Tunnel started Nov., 1921	150,000
						Preliminary work started in 1921	Total for six plants 28,500
One 3,000 hp. vertical reaction turbine	230 to 265	33,000-volt tie line, 600′ long	Wood pole	1—2,500 kva.	G. E. Co. 4,400 volts	In service June 3, 1921	5,000
One impulse wheel, 4,470 hp.	2,000	87,000-volt				To be begun by June, 1922	3,350
One impulse wheel, 17,900 hp.	1,600	87,000-volt				To be begun by June, 1922	13,400

Self Improvement in Salesmanship

A University Study Course for the Man who Meets the Public in Every Line of Business

By WILLIAM A. RUSSELL
Professor of Sales Management, University of Washington
Educational Director, Northwest Electric Service League

I. THE SALESMAN HIMSELF

In these days of intensive national advertising the time-honored adage becomes more and more true that the surest way for anyone to improve his salesmanship is to improve himself. Try only to remember how many times you went considerably out of your way to make a purchase at a place where you "liked the people," and you will agree that the salesman who would sell goods to people must first "sell" himself.

We all know people whom we like, and other people whom we dislike. But if we try to state the reasons in either case, we find—and to many this will be a discovery—that it is usually easy to explain the causes which make us dislike this or that person, but extremely difficult to put our finger on the specific reasons which attract us towards certain salespeople. In fact, for the average salesman the absence of unfavorable or antagonizing traits is much more important than the possession of some strongly developed attractive points accompanied by some uneliminated irritating or provoking peculiarities. We all know this very well as can be clearly seen from the way we sing the praises of "correctness" in appearance and behavior. We value correctness because it predisposes us toward the "correct" person; and the "incorrectness" of a person prejudices us against everything connected with him or her.

With these ideas in mind, let us now imagine ourselves as buyers, and construct in our minds the picture of a salesman as he comes within our field of vision, approaches us, speaks to us, until finally he departs and leaves behind him certain remembrances in our mind. This imaginary visit will permit us to construct, step by step, a schedule of those characteristics of the salesman himself which impress the buyer either favorably or unfavorably, and which therefore we must either cultivate in ourselves or strive to eradicate from our personality.

Impressions Made on Buyer by Salesman

Supposing that you are the buyer, and that a salesman has entered the office or store where you are, your attention will probably be attracted to him while he is still away in the distance. Nevertheless, certain things about him will even then create some preliminary impressions upon you, whether you are conscious of that fact or not. And mind you that just in this last statement there is embodied one of the most important factors of successful salesmanship: I said, "whether you are conscious or not of that fact," and I meant it. **Subconscious impressions which we create in other people's minds are at least as important as, if not more important than, the conscious impressions they receive.** And as it is the primary object of a good salesman to handicap himself as little as possible by any unfavorable factors whatsoever, he must all the time bear in mind these subconscious impressions he makes on the buyer, and try to make them as much in his favor as he can by deliberately foreseeing them.

A conspicuously and loudly dressed salesman is pretty sure to irritate us. We will class him as a "dude" and transfer our dislike for "dudes" to the house he represents and to his goods; we cannot help such a subconscious transfer of dislikes. Or else,—would you like a salesman to come into your office in shirt sleeves? Of course, this point will strike you as very elementary. But check yourself up. Do you ever serve customers, dressed in a way in which you would resent a salesman serving you? Think this point over, be quite frank with yourself, and put your present score down opposite this point. Is it 100? or 90? or only 70 or 50? And if it is less than 100, rate yourself again after a while. Try and see whether you cannot bring it up to 100 and keep it there.

Salesman's Bearing

We hardly ever consciously observe a good, vigorous bearing of a man; and therefore we rarely appreciate the fact that a good, semi-miltary bearing predisposes us towards people who always exhibit it. Without realizing it, we associate erect bearing with bodily health and fitness, and a slouchy bearing with a slouchy personality whom we do not trust very much. Catch a glimpse of your habitual bearing in a mirror. Can you rate it at 100? Put your present score down quite frankly, and watch it grow. You are the only person who can improve it.

Watch the hypothetical salesman who just entered your office or store, hesitatingly and without assurance, turn first one way and then another, shuffle his feet, etc. Do you feel quite sure in advance that he has nothing to offer you that you would care to buy? How are your own movements in the presence of buyers? Are your movements dignified and full of assurance? Or do you tempt people into turning you down merely under the impression of your movements as they see them? Do not neglect to rate yourself frankly on this point now. It will help your self-improvement.

Salesman's Neatness

To continue our little imaginary playlet: the visiting salesman has asked the girl near the door who the boss of the place is, and now he is walking up to you. As he approaches you, the buyer, certain additional impressions are registered in your mind, and it does not matter whether you are conscious of them or not. They do register, and they do influence you in your dealings with that man.

It will be readily acknowledged by everybody that slovenliness on the part of the salesman prejudices the buyer against him and his proposition. At least, we are ready to admit this when we are the buyers. We do not pay any deliberate attention to this point, but let the salesman who approaches us look as if he had "slept in his clothes," and see how quickly we try to get rid of him! Of course, you know perfectly well what "neatness" of appearance means, but do we always apply that knowledge when we are the salesman? What will you rate your customary neatness at? 100? 75? 50? Put that present score down now, pay attention to your appearance, and see how the score will rise!

Salesman's Manners

Theoretically we all agree that courtesy is never degrading. But have you noticed that courtesy is so rare that when we meet with it our attention is invariably aroused, and a very favorable attention at that? "Manners" does not mean "mannerisms," neither does it mean freakish manners. The buyer is your real employer. It is he who pays your profits or wages for the service you render him. Be always respectful and courteous to your real employer, the customer, while you serve him, and show this in your manners. I do not even want to waste your time by telling you what is good manners, and what is not. I am quite sure that it is only necessary to remind you of this point, and also to warn you never to vent your temper aroused by purely personal matters, upon your customers: it simply does not pay.

How do your manners with your customers average now? What is your score?

Salesman's Voice

Our imaginary salesman has approached your desk, and addresses you. His first words will probably be a very ordinary greeting, and you will hardly pay attention to it, answering it quite mechanically. But suppose that his voice grates on your nerves by its high pitch, or else that he mumbles his words so that you have to ask him to repeat what he said. Will you not agree that he may readily lose his sale right then and there?

We all like people whose voice is clear, distinct, and well modulated. Subconsciously we jump at the conclusion that a person with such a voice is both sincere and competent. Do not think that a proper use of your voice is something in the nature of play-acting. Remember that public speakers, teachers, and ministers deliberately cultivate their voices because they realize how important a pleasant and sincere voice is to them when they sell their audiences their ideas. You do not need a vocal instructor to improve your voice, simply pay attention to your own way of speaking, and you will very quickly notice any defects and be able to eliminate them to a great extent.

Contact Impressions

Our imaginary visiting salesman has now come up to you and has greeted you. He is now in close contact with you, physically speaking, and you notice, without trying to do so, a number of things about him. These "contact" impressions are probably the most important ones among all the impressions you receive from your visitor, they exert their influence on you during all the time of your conversation. Hence it is so essential to the salesman's success that they be favorable to him.

Of course. it is "old stuff" that we have to be clean. We were carefully drilled in that when we were kids. But then—we were not liable at that age to forget that we had a two-day old beard on our chins, or that in the rush of things we have forgotten to put on a fresh blouse. There are a number of other things which on close contact may impress the buyer against us, tobacco odor, cheap and strong perfumery, other unpleasant odors, etc. Among other things, some salesmen seem either to believe that grease-stained hands and black finger nails are an honorary and respected badge of honest toil, or else not to know that such stains and dirt can invariably be removed by special cleaners purchasable in every drug store. Look yourself over several times during the day, are you always at the 100 point score on the count of general cleanliness?

Behavior While Selling

Again, we all know how to behave. No use even to talk about that. So this point is put down here only that you may not forget to grade yourself on that score. You see, we all know it, but we do not always think of it, whereas it is essential that we always behave politely and respectfully with our customers.

I do not mean that you should not use "improper" language. That is not the point. Use language which is clear and adapted to the customer you deal with. With simple folks use simple and direct language; with the "better class" of buyers use more dignified and less insistent language. Avoid slang and technicalities. We are all so liable to do this, forgetting that slang is offensive to many, and that technicalities are clear to us but not to the layman. This point deserves particular attention on the part of salesmen who sell technical apparatus and machinery.

A hydroelectric station at Fully in Switzerland operates under the abnormally high head of 5410 ft. The power house is situated in the Rhone valley not far from Martigny, and the water power is obtained from a lake at an elevation of 7000 ft. above sea level. Near the lake, but nevertheless submitted to appreciable pressure, is a tunnel 1650 ft. long, the iron-pipe line to the Pelton wheels being nearly three miles long. There are four waterwheels in the power station, each of 3000-hp. capacity. The water leaves the nozzles with a velocity of 590 ft. per sec.

Increasing Production in Industry

Shortcuts in Management and New Power Applications That Have Reduced the Cost of Manufacturing Processes or Increased the Rate of Production. Ideas and Suggestions by Practical Men.

Kilowatt-hour as Power Measure Readily Visualized

There are few commodities which the average man pays for that he knows so little about as he does about the kilowatt-hour; and yet there is no commodity of any nature that he buys that is more definite in character than the kilowatt-hour.

The early inventors of the steam engine turned to things familiar in their selection of a unit of power and by actual experiment they determined the amount of work done by the English dray horses of that period and they called the average amount of work done by one of these animals a horse power. Unfortunately, the kilowatt-hour does not visualize such a concrete picture of power but when it is considered that a kilowatt is 1 1/3 horsepower there is produced a mental picture of this unit of power. The horse power is defined as the amount of work which is done in lifting a weight of 33,000 pounds through a distance of one foot in one minute. The kilowatt is, therefore, the amount of work done in lifting a weight of 44,000 pounds through one foot in one minute or the work done in lifting 440 pounds through a height of 100 feet in one minute.

Now, if the kilowatt is put to work for one hour instead of one minute it will have the power to lift 26,400 pounds to a height of 100 feet. If a 25% loss is allowed in the motor and the elevating machinery it still has sufficient power to actually hoist 200 98-lb. sacks of flour from the basement to the eighth floor of a flour mill or to lift 3200 50-lb. lugs of fruit from the first to the second floor of a warehouse.

Unique Tower Line Construction Adopted in Honduras

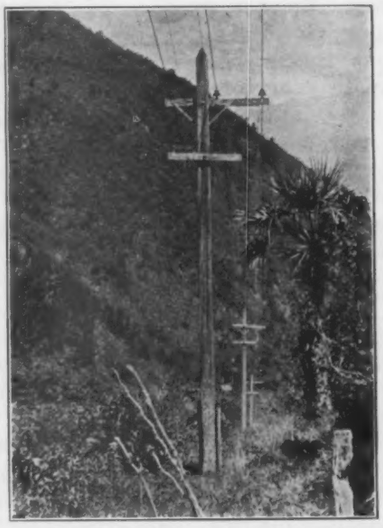
Unique methods in overcoming power line construction difficulties have been adopted by the New York and Honduras Rosario Mining Company in the mountainous section of the Central American republic. Hydroelectric power is used to operate the mine and mill, and the power is carried over a distance seven miles through extremely rough country. The timber for miles around has been removed for use in the mine and owing to the lack of transportation facilities, timber for poles was extremely scarce.

In early days the Spaniards had imported from Australia large numbers of eucalyptus trees which had grown to a size sufficient for utilization as poles. However, tests showed that these poles were readily destroyed by the abounding insect pests as well as rotting very rapidly, when set in the ground.

THIS DEPARTMENT

will be devoted to a discussion of practical problems of industrial operation and management. Readers' requests for information will be published in each issue, together with the answers to previous questions. It is hoped that readers will take full advantage of this opportunity to profit by the practical experience of others and to give others the benefit of their own discoveries. Space rates will be paid for answers which are published.

This difficulty was overcome by securely bolting to the butt of each of the poles two pieces of ordinary rail five feet long. Holes were dug and the rails set in concrete, the butts of the poles being allowed to remain at least six inches from the ground. A further



Transmission line poles in Honduras are bolted to steel rails set in concrete, leaving the pole six inches above the ground to afford protection against insects and the weather.

protection against insects was afforded by creosoting the butts of the poles.

Another distinctive feature of these towers is the angle at which the lower cross arm braces are set. This puts the three conductors in three different planes and helps to prevent their coming in contact with one another during wind storms.

FREDERICK KRUG.

San Juancito, Honduras, C. A.

New Process for Utilization of Sawdust as a Fuel

Fuel conservation is one of the vital questions of the present industrial era. Similarly important are the questions of waste in industry and the recovery of by-products. There have been developed in England and in Sweden processes which might well be classified under all three of the above headings. These processes consist of the utilization of sawdust, chips and wood shavings, as fuel at the same time recovering valuable by-products.

On the Pacific Coast, at present one of the principal lumber producing sections of this country, little or no attempt is made to utilize this cheap fuel and in many instances, great quantities are wastefully burned around the larger lumber mills. Of late there have been some experiments in the Pacific Northwest with the so-called "hogged fuel" which have proved highly successful. Yet the processes devised in Europe are even more far reaching than the simple burning of the sawdust and chips beneath boilers for the production of steam which in turn is used to generate electricity.

They consist of the production of gas from the sawdust, which is used to drive internal combustion engines and electric generators, with the added advantage that provision can be made for the recovery of tar, wood naptha, acetic acid and other by-products. At the same time the remaining ash is used in the manufacture of fertilizer.

One of the most complete installations of this kind is located at the timber mills of John Sadd and Sons, Ltd., Maldon, England. That the process has proven highly successful is indicated in the fact that the initial installation of two sets of 100-hp. waste-wood gas producers with the corresponding internal combustion engines and generators, has been increased until the present gas producer plant contains machinery rated at approximately 1050 hp. as well as two auxiliary 150-hp. producers. Over 900 hp. in electrical energy at 440 volts potential are produced.

The gas from the producers is passed through a dust collector, then into a coke scrubber, through a motor driven tar extractor, and finally through a wood-wool scrubber before passing into the engines. The gas produced is of such excellent quality that the engines produce well over their nominal rating.

The crude tar produced sells for approximately $5 per barrel while the ash brings $15 a ton as fertilizer. Other by-products are not recovered at this plant, although the company is considering installing the necessary equipment for the recovery of naptha.

Western Dealer, Jobber and Agent

Business building suggestions for the store—Distribution and warehousing methods—Advertising and sales promotion ideas

California Campaign Essay Contests Successful

Secures Valuable Publicity From Electrical Cooperative Campaign Competition in Los Angeles and San Francisco

The effectiveness of the essay contest as a means of obtaining publicity for the electrical appliance idea has been demonstrated by the California Electrical Cooperative Campaign which has just completed two such contests, one in Los Angeles and the other in San Francisco. Each was conducted in conjunction with a local newspaper.

The San Francisco contest, made possible by the cooperation of the San Francisco Bulletin, was held between December 5 and December 20. It brought forth a total of 520 essays from all parts of California together with some from Nevada, Iowa, Illinois, South Dakota, Indiana and New York. A total of thirty-four prizes, all electrical appliances, were donated by power companies, manufacturers and jobbers. The Cooperative Campaign, through the contests, secured approximately 527 inches of publicity in the newspaper, which, at the lowest contract advertising rate would have cost $1476.

The Los Angeles contest was conducted through the agency of the Los Angeles Express and brought forth over 1000 essays with a scattering representation from states as far east as Pennsylvania. Sixty prizes were offered in the southern California city. This contest netted the campaign approximately 517 inches of publicity, the cost of which would have been $834 if space had been purchased at regular advertising rates.

The essays were on the subject, "Why Electricity Is the Modern Servant in the American Household." The essay which won the first prize in the San Francisco contest follows:

"I am a white-haired grandmother. By day I sit in my big, soft chair before the heater's pleasant glow. Around me play my daughter's three small children.

"Their mother often joins them in their games, or sits and reads to me. At other times she will say, 'See to them, grandmother. I'm out for the day.'

"She is a better housekeeper than I, her mother, who always was prideful of my home. Her family is better cared for than was mine. She is a loving wife and mother. Her responsibilities are many and she bears them well. Yet she has leisure twice greater than was mine at her age. From my soul I envy her this leisure.

"I found no time for many of the finer things she enjoys so fully—good books, congenial friends. I always was 'too busy.' In my youth only the very rich—those with many servants—could have the leisure which is my daughter's.

"She is not rich. She has a single servant. The pay is small, the hours long. Her servant is Electricity. Baking, washing, cleaning, mending, heating—there is, in fact, scarcely any household task at which this servant does not aid. Electricity assumes the drudgery, the chores. The pleasant tasks alone remain.

"My span has been a full one. I have seen great changes. The greatest to me is the housewife's altered state. No longer need she be a drudge. Each may have a servant."

Eastern Editor Gives Western Idea New Interpretation

Carrying to the East the Electrical Home idea, the inspiration for which he received during a visit to the West, O. H. Caldwell, editor of Electrical Merchandising, has begun a movement advocating the electrical home for the electrical man, a thought which the West might well adopt.

Arguing that the ownership of an electrical home is a business obligation which the electrical man owes to his friends and the people of his community, a recent editorial from Electrical Merchandising, in presenting this Western idea of the Home Electric, in a new light, states:

"We can never expect the lay public to adopt and use these electrical appliances and conveniences unless we ourselves first adopt and use them. We cannot look to the non-electrical family to 'Do It Electrically" when the electrical man's own family is bereft of the wonderful labor-saving conveniences which we are in the business of manufacturing and distributing.

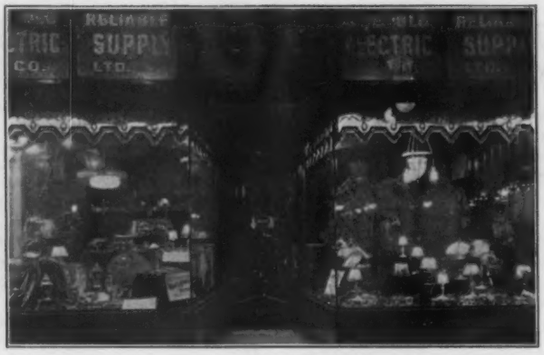
"We firmly believe that one of the most effective ways for the electrical industry to get the Home Electric idea accepted by the general public is for the men of the electrical industry to **try out their own prescriptions and take their own medicine**—and this means Electrical Homes for Electrical Men."

O. H. Caldwell, editor of Electrical Merchandising, became acquainted with the electrical home idea during a visit to the West. Now he is giving this idea a new interpretation in the East by advocating electrical homes for electrical men. He practices what he preaches for the above two views are taken from his own home. Even the children in the nursery are taught the conveniences of electricity. Insert shows Mr. Caldwell himself.

Attractive Store Displays of B. C. Contractor-Dealers

Merchandising Methods Fostered in Canadian Province by Electrical Service League of British Columbia Aid Vancouver Merchants in Increasing Sales

Situated in Vancouver's fashionable home district, the P. F. Letts Electric Company specializes in home illumination and interior decoration, using the entire store to display artistic home fixtures.



Few cities the size of Vancouver can boast of an exclusive electrical contractor-dealer store in the heart of the fashionable shopping district, such as the Electrical Supply and Contracting Co., Ltd.

The convenience of the customer has been considered by Hume and Rumble in laying out the interior of their store to display their stock.

The British Columbia Electric Railway Company, Ltd., Vancouver's central station, maintains one of the largest showrooms for appliances on the Pacific Coast. Particular attention is paid to interior arrangement.

A corner of the showroom of the central station shows the manner in which the comfort and convenience of customers is attended to in aggressively promoting the use of power consuming devices.

Out in Westminster, Hume and Rumble have set up a contractor-dealer establishment to serve the needs of this residence section of Vancouver, at the same time rendering a definite service.

Unique Plan for Furnishing Denver Electrical Home

Drawings for the appliances to be displayed in Denver's first electrical home, which will be opened within the next thirty days, was the feature of the December general meeting of the Electrical Cooperative League in Denver. Over one hundred were present and the competition in drawings, together with enthusiasm over the cooperative advertising campaign, made the meeting even more successful than those held in previous months, according to reports.

The League sent out questionnaires before the meeting to all its members asking what each one thought as to the appliances going into the home. The replies received enabled the committee, consisting of John J. Cooper, Alex Hibbard, N. R. Crooks and R. W. Elliott, to tabulate the equipment for the home. For those items in which only one firm was interested no drawings were held. Likewise when one firm drew one of the major appliances, such as the range or washing machine, it was precluded from further drawing on that class of equipment.

The committee now has a list of fifty different appliances which will be placed in the home, ranging from the heavy laundry equipment to a boudoir incense burner. It was announced that these appliances would not be installed until all the furnishings had been placed in the house by the Daniels & Fisher Company, one of Denver's leading department stores which believes so thoroughly in the electrical home idea that the merchandising manager, A. B. Trott, has laid out on the furniture floor five rooms with walls and all the features of a home, excepting that one side of the room is left open. Proper lighting and plenty of convenience outlets are provided for this novel store demonstration.

Montana Power Company Installs Novel Heater Display

Unique methods to stimulate the sale of electric heaters were recently adopted by the Montana Power Company in Butte during the heavy storms which have been sweeping that section of the West. A line of electric heaters mounted on pedestals, waist high, has been placed along the outer edge of the sidewalk, extending the entire width of the building. The heaters operate throughout the day and give striking proof of the versatility and efficiency of electricity.

The efficiency of the heater is convincingly proved in the company's present display. During the recent heavy storms, with wind, sleet and snow playing havoc with traffic and discommoding pedestrians, the line of twenty-four heaters defied the elements and gave out a constant flow of warmth.

The display does not stop with the line of heaters, however. The windows of the office display cards explaining the various features of the heaters. Cost figures are prominently displayed, the statement being made that the heater costs six cents per hour to operate them connected to a lighting circuit. Merchandising methods which capitalize the elements in this manner are certain to increase sales. Seasonal sales campaigns have again proven successful.

The Contractor-Dealer and His Advertising Plan

The Elements of Good Advertising and How They May be Applied to This Branch of the Electrical Industry

By W. D. MORIARTY
Field Representative, Northwest Electrical Service League

An advertisement must attract attention. This is the first law of advertising. You can get attention by large space, by distinctive borders, by distinctive type, by distinctive use of white space, by distinctive catch lines, but by some means or other you must get attention. Use your brains to decide on the cheapest and best way, not the cheapest way but the cheapest and best way.

It may be that it will pay you to buy a distinctive border, even a border in cut form to make sure no one else will use it. If you do, it is cheapest to get a good one, something you can take pride in. It may be that in your locality it pays to use cuts furnished by the manufacturer. This is your business to decide, no rules of advertising can take the place of your own personal brains on your own personal problems. But either distinctive border or distinctive illustration is almost essential to best results in most publications.

An Advertisement Must Create Interest

This is another way of saying that an advertisement must crowd other things out long enough to give the thing advertised, or the store advertised, a fair chance at the customer's mind. It is not enough for an advertisement to attract attention, it must attract attention to the thing advertised and hold that attention long enough for the idea "to soak in." Beware of making your advertisement too short. As long as you are really saying something, keep at it.

Here also is the great reason for using the same idea again and again in advertising, "ringing the changes" on it. Say it again but say it differently and the idea gets one more chance. Repetition, just sheer repetition, has an undeniable effect, and intelligent repetition that retains the interest of the reader is one of the great advertising forces which any man can use.

Repetition is one of the most powerful factors in creating belief. In spite of the Roosevelt panic there are millions of Americans who believe that the only way in which really hard times can be brought about is by the election of a Democratic president. Reputations are destroyed by repetition, reputations are built up in the same way. Get busy and build yours, don't leave it to your friends.

There are other ways of creating confidence. The advertisement must "ring true," must have personality, must be backed up by store policy and store salesmanship. But some advertisements have nothing in them that calls for belief, and such an ad can not possibly be a good one. "John Jones, electrical supplies, wiring a specialty" is an announcement but not an advertisement.

The slogan is one way of securing repetition, and a valuable way if the slogan is intelligently used and really backed up. I have seen stores, however, that used "Everything Electrical" which were a long way from that standard, in every direction, hopelessly inadequate stock, their show cases unlighted, etc. A slogan is a war cry and must be sounded and fought up to. By all means get a slogan if you can get one that fits your business policy, but don't take one that doesn't fit and use the one that does fit aggressively.

An Advertisement Must Be Remembered

Here is another reason for everlasting repetition. You must establish your reputation so firmly in the minds of your customers that when they think of something you carry they will think of you. It is not enough if when they think of a washing machine they think of the one you carry. They may think all they please of that particular washing machine but if they think of your competitor and go to his store, what chance have you if he happens to be a real salesman?

The advertisement must inspire confidence in the reader and it must be remembered, but the most important thing in the advertisement in both these vital respects must be you and your store. This is the vital reason why you must TALK in your advertisements. Mere display advertisement is generally poor advertising, in all fields and especially in yours. A customer must have a REASON for trading with you, and an announcement is not a reason.

Test your advertising by imagining yourself reading it to customers as the beginning of your sales talk. It isn't advertising if it will not stand this test.

If a customer has read your advertising you should not talk to him as if he hadn't. Don't waste the good impression with which he comes to your store. Build on it. Capitalize it.

To advertise convincingly you must believe your advertising will sell your goods, just as you must believe your sales talk will sell your goods. What would you think of a salesman who ambled forward saying to himself, "Well, here goes. I haven't very much faith in this talking business but everybody else does it and I suppose I ought to do a little." Yet this is the way many advertisers advertise.

If you get someone else to do your advertising, either a clerk or an outsider, see to it that every salesman in your employ is sold on the idea that advertising helps. If you can't sell your clerks and yourself, how can you expect to sell others? And this is the point to sound the warning "Beware of 'bunk' in advertising." An advertisement that a clerk doesn't believe is a boomerang on your business. Sell your advertising to yourself first of all, then to your clerks, and then build on it when you sell to your customers.

EDITOR'S NOTE

This is the second of a series of articles by Mr. Moriarty on advertising for the contractor-dealer. The third article will appear in an early issue of the Journal of Electricity and Western Industry.

Activities of the West

A Business Man's Department Devoted to Events and Developments in Western Industrial Centers—Including News of Interest to Readers in Public Utility, Industrial and Trade Fields

Far East Offers U. S. Market

Hydroelectric Developments in Lands Bordering Pacific Announced

That the countries bordering on the Pacific ocean constitute one of the greatest markets in the world for American hydroelectric machinery, is the opinion of United States Department of Commerce officials as set down in a statement recently issued regarding hydroelectric development proposed or under construction in the Orient and other countries bordering the Pacific. Japan, China, India, Java and other East Indian islands, Australia and New Zealand are markets where such machinery might be disposed of at the present time, the report states.

While contracts with either the government or privately owned companies in the various countries are announced from time to time, these markets have not been as highly exploited by American companies as they have by foreign concerns, in the opinion of the commerce experts.

They point to South America where British and German firms have developed large markets for special machinery, while American companies, through lacakadaisical methods, have lost millions of dollars in contracts. They add however that American firms more recently have become competitors with these firms.

New Zealand forms the important market at the present time for hydroelectric machinery, department of commerce records show. The government of that British province has recently announced plans for the development of a hydroelectric system totaling 270,000 horsepower in order to conserve coal. Eight separate developments ranging in size from 1000 to 96,000 horsepower capacity will be undertaken during 1922 and 1923.

New Rubber Manufacturing Plant For Pacific Northwest

Rubber manufacturing is to be a new industry in the Pacific Northwest, according to an announcement made by A. M. Elliott, president of the newly organized Pacific States Rubber Company, that his company will immediately start the erection of a $500,000 factory at Vancouver, Wash.

The Pacific Coast ports are the principal points of entry for crude rubber to this country from the Straits Settlements and the islands of the Pacific. Most of this rubber is taken to eastern manufacturing centers at the present time, made into finished products and returned to the coast for sale and export. Excessive freight rates have added considerably to the cost. By establishing a factory in the West, it is believed that tires, tubes, and other rubber articles can be produced much cheaper than the eastern products. The shortage of suitable cotton fiber for the manufacture of automobile tires is no longer one of the reasons for lack of rubber factories on this coast as such cotton is being produced in large quantities in southern California and Arizona.

The Pacific States Rubber Company, which is planning the erection of the Vancouver plant, is capitalized for $2,500,000.

Denver Will Have $10,000,000 Electric Smelter

Denver will shortly be the Pittsburg of the West, according to Charles E. Havener, president of the Utah-Colorado Mining and Milling Company, who has announced that his company is planning the erection of a $10,000,000 electric smelting plant to be constructed in that city during the coming year. Electrolytic steel will be one of the chief products of the mills.

According to the announcement a 120-acre site has already been purchased for the plant, and plans are being drawn. Alfred Bell, noted mining engineer, will be in charge of the construction. The plant when completed will comprise 42 separate buildings, will employ 600 men and have a capacity ranging from 25,000 to 50,000 tons of ore daily.

Urge $5 Per Ton Freight Rate on Copper to Los Angeles

James S. Douglas, pioneer Arizona mining man, has presented to the Los Angeles Chamber of Commerce a plan to make that city the copper center of the Pacific Coast provided a $5--a-ton freight rate can be secured on the unrefined red metal from the Arizona and Utah mines to the port of Los Angeles. It is planned to erect refineries and mills at that point and ship the metal by steamer to all parts of the world.

The total value of the copper output of Arizona during normal times has been placed in excess of $100,000,000 annually and it is planned to make the southern California city the outlet for this product. Mr. Douglas points out that during the war, when copper prices were at the highest point, freight rates to eastern manufacturing centers and shipping points were $16.50 per ton. He points out that this rate covered a haul of approximately 3000 miles against a haul of 540 miles from the mines to the Pacific Coast. He urges that with an abundance of electric power for the operation of a refinery and allied copper manufacturing plants, a new industry can be given to the West.

Portland Industries Growing

Consumption of Power Increases Despite Closing of War Industries

The after-the-war slump hit Portland and many other communities a staggering blow, but Portland's record as indicated by reports of electrical energy generated by the power companies serving this industrial community are extremely gratifying to those who have money invested here in either power companies' securities or comercial enterprises. The figures compiled by the local power companies for the Chamber of Commerce would seem to substantiate Portland's claim that it is built up on diversified industry and on such a substantial basis that the growth continues in spite of economic disturbances. The following figures are taken from a recent issue of "Commerce":

"The first two weeks in November, 1919, compared with the first two weeks of November, 1921, show an increase of 14 per cent in kilowatt-hours generated. When it is realized that during the period of November, 1919, to November, 1921, large plants engaged in shipbuilding and allied industries closed down completely, causing a decrease in power generation of approximately 3,000,000 kilowatt-hours per month, the steady uniform growth of the power business, made up by small increases scattered over a widely diversified list of local manufacturing plants, is most surprising to those who do not know Portland.

"During the period above mentioned, one plant using 500,000 kilowatt-hours during the first two weeks of November, 1919, disappeared entirely from the list in 1921. Another plant using 275,000 kilowatt-hours no longer appears. Still another using 200,000 kilowatt-hours is no longer purchasing current.

"There are many others not showing 100 per cent loss, like the case of one establishment that used 150,000 kilowatt-hours the first two weeks in November, 1919, and purchased only 300 kilowatt-hours the first two weeks in November, 1921."

In view of these figures, it is difficult to realize that residential and commercial loads have grown to such an extent and hundreds of other industrial establishments have gone ahead sufficiently to absorb the terrific loss, and show an actual net gain.

Shipping Combine Meet Set For January 19 in S. F.

Representatives from the Chambers of Commerce of Los Angeles, San Diego, Oakland, Portland, Spokane, Tacoma and Seattle will meet in San Francisco on January 19 with the Chamber of Commerce of that city for the purpose of discussing the proposed $30,000,000 pooling of the shipping interests of the Pacific Coast which has been proposed by Herbert Fleishhacker, president of the Anglo and London Paris National Bank and vice-president of the Great Western Power Company.

Events in Washington of Interest to Western Men

A Survey of Recent Developments in the Nation's Capital by Paul Wooton, Special Correspondent of the Journal of Electricity and Western Industry

The Journal of Electricity and Western Industry has arranged to furnish its readers with a resumé of legislation, happenings, and activities in Washington, D. C., which might vitally affect the development of the West. Paul Wooton, representing the McGraw-Hill technical papers in the capacity of correspondent, will furnish this service at regular intervals.

Colorado River Meeting

The outstanding engineering development in Washington of current interest to the West is the announcement by the Secretary of Commerce, Herbert C. Hoover, that the Colorado River Commission will hold its first meeting in Washington January 26, at which time a systematic plan of action will be outlined. Secretary Hoover states that the Commission will arrange at this meeting for a series of hearings in the Southwest so that an accurate idea of public opinion as to the utilization of the waters of the Colorado river may be obtained.

Federal Power Commission

Applications for license and preliminary permits under the water power act had reached a total of 269 at the end of the year. Eighty per cent of these applications have come from the western states and Alaska. The Federal Power Commission's first year has been characterized by unexpected difficulties of a highly controversial nature. As a result, the uncertainties which have been hanging over water power development for so long have not been cleared up as had been hoped. The chief difficulty has centered around the regulations promulgated for the administration of the Act. There have been sharp differences of opinion between the executive secretary of the Commission and representatives of the electrical industry, particularly in the matter of depreciation and amortization reserves.

Frequent experience in the past has shown the fallacy of effective administration on the part of a commission composed of Cabinet officers. The duties which have first call on their time are so multitudinous as to preclude any sustained attention to commissions. While Congress is very well aware of this condition, it was thought in the case of water power administration that it would be better to vest the authority in the heads of the three departments which had been handling this type of development. The Federal Power Commission has proved no exception to the rule and meetings have been postponed more frequently than held on the dates specified. There is great difference of opinion in and out of Congress as to the handling of the staff of the Federal Power Commission. The Act provides that the Commission must draw the greater portion of its personnel from the departments of War, Interior and Agriculture. These departments have plenty of work of their own to keep their technical men employed and they are disinclined to loan them to the Federal Power Commission. The Commission contends that it should be allowed to have its own appropriation and employ its own personnel. Due to the limitation of personnel, the Commission contends that it is able only to act upon applications and conduct a very limited amount of field work. Valuations and other investigations provided in the Act cannot be undertaken under present conditions.

Recently the full Commission heard the views of the representatives of the electrical industry on the matter of depreciation. A decision in that important matter is expected in the near future. It is believed that this will have an important bearing on clearing the atmosphere and at least establishing the administration's policy with regard to the jurisdiction of the Commission.

At the end of the year applications were on file covering projects having an estimated installed capacity of nearly 17,000,000 hp. The primary power involved in these applications was in excess of 11,000,000 hp.

Metric System

Very exhaustive presentations of views for and against the compulsory adoption of the metric system as the sole standard of weights and measures in the United States have been made before a sub-committee of the Senate Committee on Manufactures. Senator McNary of Oregon is the chairman of the sub-committee, who has been in active charge of the hearing. The hearing has been based on a bill introduced by Senator Ladd of North Dakota, which provides that the metric system be put into effect by law ten years after the passage of the act.

The hearing has had the effect of building up a very complete record on this much controverted subject. It is a generally held view, however, that sentiment in Congress at this time is unfavorable to the establishment of such a change by legislation.

Gold and Silver Output

Preliminary figures issued by the Bureau of the Mint and the U. S. Geological Survey indicate that the 1921 gold production was less than that of 1920 by more than $2,000,000. Despite the fact that the Pittman Act provided an immediate market for silver at $1 an ounce, the silver production in 1921 was 5,000,000 fine ounces less than that of 1920. The exact figures for the 1921 output are: gold, 2,375,479 ounces; silver, 50,364,389 ounces. The extent of the decline in precious metal production may be judged by comparing the 1921 output with that of the record established in 1915 when the country produced $101,035,700 worth of gold and 74,961,075 fine ounces of silver.

Water Power Census

The U. S. Geological Survey will issue during February a census of the developed water power in the United States. This census will include only plants of 100 hp. or more. The survey, however, will make available much pertinent information with regard to approximately 1,000 of the principal water-power plants in the country.

Telluride Power Co. Granted 16% Rate Increase

The Telluride Power Company, which serves a large portion of southern Utah, has been granted an increase in rates by the public utilities commission of Utah, which will increase its revenues by about 16 per cent.

The new rate for residential lighting runs from 14 cents per kilowatt-hour for the first thirty kilowatts of monthly consumption down to nine cents per kilowatt-hour for all consumption per month in excess of sixty kilowatts. Commercial lighting rates have a similar range, but with different consumption factors. Several of the present schedules, such as those for commercial lighting with optional load factor rate, sign and display lighting and municipal incandescent street lighting, are not changed.

The Deer Trail Mining Company, which takes about one-third of the output of the Telluride company, will not be affected by the increase in rates, but the company is ordered to publish a schedule embodying the terms of the Deer Trail contract, of which any customer may take advantage if he cares to.

A. R. Heywood, president of the public utilities commission, dissented from the opinion of the other two commissioners who granted the rate increase as the majority.

The majority report says in part:

"During the war period a customary objection made by a class of protestants at rate hearings was to the effect that prices of every kind were advancing with great rapidity, and the public generally was carrying heavy burdens. This being true, the commission was asked to deny relief, regardless of the showing made, until after the 'war was over'; then rates might be adjusted to meet outgo.

"Since the war this class of objection has taken the form that, though the war is over, the time is not yet to adjust rates, but that sometime, when prices are stabilized, income might be adjusted to outlay, and, further, that in unregulated industries prices are now generally declining. In adjusting rates during the war period the commission allowed only the necessary minimum increases to meet enormously advanced prices for materials and labor to the utilities, and those increases became only generally effective after increased prices to the utility had occurred."

The commission finds that the book value of the company is around $1,100,000 when proper deductions are made, but does not establish this as the value of the property. It shows calculations to the effect that, after cost of operation and reasonable depreciation are allowed, the company in 1920 earned only 5 per cent on a valuation of $402,000. The company asked additional revenue to yield about $60,000.

As nearly as may be calculated from the commission's decision, the additional revenues granted through the increased rates will amount to about one-half of that amount.

Reduction in freight rates on electric appliances, supplies and machinery from eastern points to the Pacific Coast have been announced by the Southern Pacific Company. The old rates on electrical appliances, electrical machinery and supplies, including empty electrical storage and battery boxes at present range from $3.25 per 100 pounds from New York to $2.66 from Kansas City. The new rates will range from $2.89 to $2.40 from these points.

Electrical interests of Denver perfected the illumination scheme which was used to effectively set off the city's civic center and at the same time enhance the attractiveness of the municipal Christmas tree.

Holiday Illumination of Denver Civic Center Applauded

What is considered by many the foremost example of cooperation in civic development in the United States, was the electrification of the Civic Center in Denver during the holidays.

Ornamental lighting standards were clothed with evergreens and the lamps were changed to red and green, while the Greek theatre and Voorhies Memorial were artistically draped in such a way as to take advantage of the unusually effective lighting arrangement.

The most prominent feature in the display was a 70-ft. Christmas tree illuminated with 1800 vari-colored lamps and surmounted with a white star of dazzling brilliancy. Streamers radiated from the tree itself to an outer circle of trees which were backed by the classic structures of the Civic Center.

The Denver Gas and Electric Light Company made the installation, in conjunction with the city authorities. City firemen assisted in the work. The Electrical Cooperative League of Denver supported the movement as part of its civic development program, and it is reported that T. O. Kennedy, the League chairman, through his company and with D. C. McClure, his assistant, is entitled to a large portion of the credit for producing such an effective display.

Wage Cuts Announced in Many Utah Mining Districts

Wage cuts by mining companies operating in the Bingham district, effective January 16, 1922, have been posted as follows:

A reduction of 50 cents a day in the wages of all men receiving more than $3 a day; a reduction of 40 cents a day in the wages of those receiving less than $3 a day.

Six mining companies announced the reduction, which concerns at this time 585 men, distributed as follows: Utah Consolidated, fifty men; Utah Apex, twenty; United States Mines Company, 350; Bingham Mines, sixty-five; Utah-Boston, forty; Utah Copper Company, sixty. A similar reduction has been announced in the Tintic district.

Opening of Denver Electrical Home Delayed 30 Days

The opening of Denver's first electrical home has been delayed thirty days owing to slower developments in finishing the home than was originally anticipated by the officers of the Electrical Cooperative League, under whose auspices the home is being built.

Roughing-in the electrical work, according to reports, required three times the amount of labor used in building the average house. This may be more easily understood when it is known that the house has 22 lighting circuits and nine power circuits with a total of over 150 outlets.

Conduit was laid on top of the false floors, which with stripping brought the regular flooring flush with the door sills, a feature in the construction of the house. Pictures were taken before sealing the walls and floors to have a lasting record for reference in urging future construction of that type.

As an example of the cooperation developed in the building of the home, it was recently announced by the League that the local electricians' union had subscribed for a block of stock in the home and that a number of the individual journeymen had also made subscriptions.

S. F. League Censures California Senator for Armament Stand

The San Francisco Electrical Development League has gone on record as opposing the stand taken by Hiram W. Johnson, United States Senator from California, regarding the disarmament conference. A resolution censuring the California Senator was passed by the league at a recent meeting and copies sent to Washington. A short time ago the league members sent resolutions to Washington congratulating President Harding and Secretary of State Hughes for the steps which the conference was taking. The resolution passed by the league follows:

"In view of the fact that Senator Hiram W. Johnson, United States Senator from California, has publicly stated that he is not in favor of the present limitation of armament as proposed at the National Capitol and is openly criticising the proposed articles that have been drawn up by the Disarmament Conference,

"Be it resolved by the San Francisco Electrical Development League, composed of seven hundred men interested in the development of central California, that we by open vote in our organization show our disapprobation of Senator Johnson's public utterances regarding the Disarmament Conference and hereby express to Secretary Hughes and his associates our wholehearted and enthusiastic endorsement of the disarmament work of the Conference."

Building and Construction Body Formed in Portland

At the instigation of the Portland chapter of the American Institute of Architects, an association has been formed and designated as the "Building and Construction Association of Oregon." The association is formed to secure greater efficiency in building and construction and through its fields of activity will seek to accomplish this objective as follows:

To foster and to organize proper educational facilities for those engaged in building and construction.

To assist wherein it may, in the organization and conduct of a "Guild of Building Handicrafts," and other similar organizations, as a means to elevate the standard of craftsmanship and of securing recognition for the skilled mechanic.

To conduct or have conducted exhibitions, expositions, conferences or campaigns to bring before its members and the public, the problems and achievements in building and construction.

To conduct and aid scientific and economic research and surveys pertaining to building and construction, and to provide for distributing to its members and the public the result of such research and surveys.

To make possible a social contact between the various elements engaging in building and construction.

The constitution provides that the association shall never declare itself for or against the closed shop or open shop issue, and that it shall never pass resolutions or orders of a mandatory character carrying conditions pertaining to inter-relationships of organizations or units of those engaging in building and construction.

Land Commission Rules Against Utah Power and Light Co.

The land commissioner at Washington has sustained the decision of the registrar of the Salt Lake City land office, who rejected the claim of the Utah Power & Light Co. to 423 acres of land in Big Cottonwood canyon. The power company filed on the land as a limestone claim and has used it for water power purposes, the tract embracing the Big Cottonwood creek.

The claim was contested by the United States Forestry Service, as it is within the boundaries of the Wasatch national forest reserve. It was contended by the forestry officials that the property does not contain limestone in commercial quantities.

The power company has thirty days in which to appeal to the Secretary of the Interior. The power company has made extensive improvements on the property for power development purposes.

Work on the Southern California Edson Company's supply station at Alhambra will be started in the near future according to officials of the company. The station, which will cost approximately $500,000 and cover 21 acres of ground, will furnish supplies to 28 Southern California districts of the company, located in ten counties. More than 300 men will be employed at the station when it is completed.

Los Angeles Refuses to Give Up Kings River Filings

Los Angeles has refused to withdraw its filings for hydroelectric development on the south and middle forks of the Kings River as has been requested by the head of the National Park Service, in order that this territory might be declared the Roosevelt National Park and placed on the same status as Yosemite National Park.

Stephen T. Mather advised the city of Los Angeles that the Southern California Edison Company and the San Joaquin Light and Power Corporation had both withdrawn their requests for water in the section at the request of the Park service. Mr. Mather said, in his telegram to Chief Electrical Engineer Scattergood of the southern city:

"Please consider this an appeal to you to get word at once to N. J. Sinnot, chairman of the Public Lands Committee, withdrawing unqualifiedly the City of Los Angeles' applications for this area and join with the Roosevelt Memorial Association and the millions of admirers of Col. Roosevelt in presenting to the American people a great recreational area free from water-power development in any form. Inasmuch as private interests have renounced all their potential claims, Los Angeles can surely afford to waive a very remote power possibility in favor of another great national park for California."

Special Counsel Matthews of the Board of Public Service Commissioners, declared in his telegram that the city had spent $40,000 in surveys in this area and was determined to proceed with the development.

Three Utility Initiative Acts to be on California Ballot

Three initiative petitions involving the public utilities of California have been filed in Sacramento, the state capital, recently, according to an announcement by Frank C. Jordan, secretary of state. The first two petitions deal with municipally owned utilities, while the other involves the so-called state water and power development act.

Under the terms of one measure which will appear on the ballot in the 1922 election, municipally owned utilities are to be declared public utilities and the second measure compels them to pay taxes as do all other privately owned utilities in the state. The act declaring municipally owned utilities to be public utilities would place these departments of the city government under the control of the State Railroad Commission.

The third petition involves the measure propounded by the California League of Municipalities which would place all waters of the state under the control of a board of appointees of the governor. This body would be charged with the development of the water resources either for irrigation or power. It also provides for the bonding of the state to the extent of $500,000,000 to carry on this work.

Factional controversies have developed over the proposed application of Frank G. Baum to use the waters of the upper Salt River for the development of power, on the grounds that such a project threatens to interfere with the Roosevelt Dam and further exploitation of the irrigable lands in that vicinity. Eighteen clubs, towns and irrigation districts appeared before E. C. LaRue at Phoenix on January 3 in an attempt to block the application.

Figures Show Growth of Denver During Year 1921

Intermountain City's Population Increases 20,000, Factories Gain, Public Utility Records Disclose

That Denver has grown both industrially and in population during 1921 has been proven in figures compiled by public utility companies and the Secretary of State. The growth in population for the year is placed at 20,000, giving the city a population of 276,401 at the present time.

Similarly building permits reached the highest level in ten years, with indications that the majority of permits were for the construction of homes.

The growth in population is based upon the following facts: The net gain in the number of telephones was 4160 with 1500 applications on file. The ratio of telephones to population in Denver is one to five, showing an increase in population of over 20,000.

The increase in the number of electric customers of the Denver Gas and Electric Light Company from March 1 to December 1 was 5662. Similarly gas customers increased 836 during the same period.

Water users increased in an even greater ratio.

During 1921, building permits to the number of 5606 were issued with a total value of $10,137,025. The value of the new homes constructed is placed at $4,691,000. It is estimated that between five and eight per cent of this was spent in the electrical equipment. The fact that the number and value of the permits issued has constantly increased month by month since January, 1921, with one or two exceptions, is taken as an indication that the volume of building will increase to greater proportions during the coming year.

The investigation conducted by the department of factory inspection under the direction of the Secretary of State, shows that in seven industries the annual payroll amounts to approximately $106,000,000 while the number of workers totals 60,565. Sixty-six per cent of the industries of the state are located in Denver and Pueblo. These figures show that there are in the state of Colorado 3025 industrial establishments, producing materials valued at $316,965,000 annually. These industries represent an invested capital of $280,000,000.

Denver, as the heart of this district, is the first city in size in the Intermountain district.

Western States to Plead for Reduced Freight Rates

Four western states have joined in appointing a representative to attend the general rate hearing before the Interstate Commerce Commission in Washington and press their claims for reduced rates on the products of the basic industries of the West. Utah, Wyoming, Colorado and Idaho have chosen H. H. Prickett, manager of the state traffic bureau of Utah, to act as special counsel for them at the hearings. At a recent conference between the governors of the four states the following basic commodities were included in the list on which drastic reductions will be asked so that the West may develop its industries: the products of agriculture, of the metalliferous and carboniferous mines, wool, livestock, canned goods, petroleum and petroleum products, fruits and vegetables and the products of the forests.

San Francisco Takes Steps To Protect Foreign Trade

San Francisco steamship and railroad interests have reached an agreement to share equally in absorbing the differential of 15 cents per ton port toll charges on all Oriental freight consigned to points east of the Mississippi river. This move was taken to place San Francisco harbor on an equal footing with those of Los Angeles, Seattle and Portland, which have removed all differential toll charges.

Until last year San Francisco had the lowest dockage charge of any Pacific Coast port, charging fifteen cents per ton against prevailing rates of 25 and 30 cents at other ports.

Shipping men have pointed out that while removing this charge in no manner affects the San Francisco harbor commission or the upkeep of the harbor equipment, the other Pacific Coast ports will suffer from the loss of this revenue. At the present time it is estimated that in excess of forty-nine per cent of the total value of all trade through Pacific Coast ports passes through San Francisco. The removal of the toll charges by other cities was interpreted as a step to secure some of this commerce.

Forest Service Offers for Sale California Timber Tract

The largest single stand of timber ever to be advertised for sale by the government, has been placed on the market by the San Francisco office of the United States Forest Service. The timber comprises approximately one billion board feet of yellow, Jeffrey, sugar and Lodgepole pine, white and red fir and incense cedar in the Lassen National Forest near Eagle Lake, Lassen county.

The timber, "on the stump," is given a value of $3,350,000. The purchaser must cut it in a manner that will conserve the young trees and at the same time allow for a complete reforestration by the government. The bidding period on the tract will close April 1, although this date may be extended thirty days to allow prospective purchasers to visit the land.

Wages of employes of fifty foundries of the San Francisco bay district were cut ten per cent on January first and at the same time the American plan was put into effect in an effort to stimulate the metal trades industry. Foundrymen in other sections of the state, who have not been bound by agreements with unions, have been doing much of the work that might have been done in the bay region, according to members of the California Metal Trades Association.

Portland to Have Additional Terminal Facilities

To meet the demands for larger shipping facilities in the inner harbor, the Portland Public Dock Commission at a recent meeting voted to purchase the site of the former plant of the Willamette Iron and Steel Works adjoining municipal terminal No. 1 on the north, for the sum of $180,000. W. C. Alvord, president of the Portland Holding Co., from which the land will be acquired, has agreed to take Dock Commission bonds drawing five per cent interest at par for the entire amount.

The land to be acquired has a frontage of 293 ft. on the harbor line and extends west to Front Street a distance of 510 ft. The tract is occupied to a large extent by buildings of substantial construction which will be renovated and utilized for storage purposes. Several additional buildings will be erected and a modern slip constructed to accommodate one large vessel. Improvements which the Dock Commission will make to the property now will cost approximately $90,000.

The development of this tract for municipal terminal purposes will greatly relieve the congestion now at terminals 1 and 4, which recently have been unable to accommodate the vessels desiring to dock.

Pit River Tunnel of P. G. & E. Opened New Year's Eve

Workers in the Pacific Gas and Electric Company's 10,180-ft. tunnel near Fall River Mills on the Pit River project broke through on New Year's eve and the process of cementing the walls has now commenced. Work on the tunnel, which is 13½ ft. high and 11 ft. wide, was started on September 15, 1920. Frank Rolandi, the contractor, will receive $853,440 for the job.

The tunnel will be cemented six inches thick all around except the bottom, which will be 18 inches thick.

One hundred and twenty-five cars of cement will be used. In order that this cement work may be properly installed, bulkheads will be placed at both ends of the tunnel to cut off the draft of wind which blows through the tunnel with considerable force.

Through this tunnel all the water in Fall River, 1,500 second-feet, will be diverted to the Pit River side of the mountain ridge, where it will drop 454 feet into the turbines of Pit River power house No. 1, and generate 93,000 horsepower of electrical energy.

Oregon Irrigation Congress Discusses Reclamation

Irrigation and reclamation were studied from every angle during the 11th annual session of the Oregon Irrigation Congress which met December 15, 16 and 17 at Pendleton. Leading authorities on irrigation in the West were among the speakers to address the congress on the different phases of irrigation work. Not only were projects actually under way discussed but financing, government methods, laws, supervision and farmers' cooperative plans relative to irrigation and reclamation were dealt with. Many resolutions on various irrigation and reclamation questions were adopted by the congress, among the most important of which was the endorsement of the McNary-Smith bill now before Congress. This bill provides for financial government aid in bringing under cultivation approximately 20,000,000 acres of agricultural land in the United States through irrigation, drainage or diking.

There are today in the state of Oregon approximately 1,230,000 acres in projects completed or partially completed and it is estimated that there is an additional 1,000,000 acres of land that may be irrigated in addition to large areas of land which may be reclaimed through drainage and diking, and the passage of the McNary-Smith bill would greatly aid the state in financing and developing one of its greatest natural resources.

Denver to Have Largest Electric Sign in Mountain District

Denver's renown as the city of lights will ring still farther in January when the huge new Colorado theater is completed and adds its towering electric sign to the brilliance of the movie district.

Beginning just above the Sixteenth Street entrance to the Colorado, this pillar of light will extend as high as the top of the flagpole on the roof, more than seventy-two feet in all. The sign will spell the name "Colorado," with a Colorado state flag at the top in color, and will carry approximately a 48-kw. load. Each letter in the sign will be five and one-half ft. high and the channels of the letters will be seventeen in. wide; 2,123 lights will be used.

The sign will be the biggest one of pillar type installed in Denver or the entire Rocky Mountain region. It was designed by Allen Spencer of The Denver Gas and Electric Company, which company will also build it and make the installation.

The interior lighting scheme of the theater provides for the use of floodlights composed of primary colors and will be controlled from the projection booth. One main drop will be suspended in the auditorium and will have connection for 8000 watts. The mezzanine and foyer will utilize cove lighting effects entirely. The electrical work is under the direction of J. Fischer, a prominent member of the Denver Electrical Cooperative League.

Oil Production in California in 1921 Leads Nation

California's production record for crude petroleum for the year 1921 leads that of every other oil producing state in the country, according to a statement sent out by R. E. Collom, state oil and gas supervisor, in which he places the production of that state in excess of 114,000,000 barrels, an increase of 8,000,000 barrels over 1920. These figures represent a production which was hampered by a strike of almost two months duration in the fields and a readjustment to the general industrial depression. The statement by the oil and gas supervisor says:

"The maximum monthly production for California, in 1921, was reached during May. The production was 10,450,131 barrels. During May, 42 wells in the Elk Hills produced 1,794,156 barrels of oil, that is, less than ½ of 1% of the oil wells of California produced 17% of its oil."

Books and Bulletins

WINNING THE PUBLIC

by S. M. KENNEDY, vice-president in charge of public relations and business development, Southern California Edison Company. Second edition. 148 pages, 6 by 9 in. Illustrated. Published by the McGraw-Hill Book Company, New York.

The immediate response to Mr. Kennedy's book on public relations by men in the public utility field, and the new developments which have taken place since the book was first written have necessitated a second edition of "Winning the Public," incorporating the more recent ideas on customer good will. So important has become this personal element in business, that it now has a recognized place in almost every company's program, especially in the public service field.

Two new chapters have been added to the second edition. The first, "Transforming Public Opinion," embodies the greater service idea, one of the most recent developments in the public relations program. The last chapter, "Overcomplacency," is a warning to every member of a public utility from the highest official to the elevator boy, on the dangers of an apathetic attitude regarding public relationship.

These new chapters, which deal specifically with just how to institute greater service methods among large bodies of consumers of electricity, when put into practice, make possible the transformation of public opinion from an attitude of distrust to one of confidence and good will, at the same time making possible the attainment of a "closer understanding between the public utility and the public served by it."

Arc welding for repair and reclamation, general applications of arc welding, and arc welding for manufacturing processes are well described and illustrated in Leaflet 1825, just published by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. A story is told of how costs are reduced by the use of arc welding.

The Society for Electrical Development, Inc., of New York, has undertaken a campaign for the spread of propaganda on electrical precautions for the prevention of fires. A special committee is cooperating with the fire departments in many of the large cities in the country to determine the exact origin of all fires which are attributed to electricity in an effort to combat the popular opinion that electricity constitutes a serious fire hazard.

The Puget Sound Power and Light Company, Seattle, recently announced that if any part of its new issue of 8% gold coupon, 5-year notes remains unsold after January 10, 1922, such notes will be withdrawn from the market. In making this announcement, company officials said they have been aware for some time that money rates are decreasing, but that they have permitted this issue to remain on the local market in order that local investors might have every opportunity to obtain high-rate securities while these rates prevail.

Meetings of Interest to Western Men

Denver Manufacturing Interests Plan Regular Meetings

The manufacturing interests holding membership in the Denver Electrical Cooperative League, in order to effect closer coordination in support of the movement, held a special luncheon meeting in that city December 16th. It was the result of a previous meeting held by the manufacturers' representatives on the League's advisory committee and it was their opinion that such gatherings would bring to light valuable ideas which might be injected into the League's program.

H. Alex Hibbard was selected as chairman and his procedure was to call upon all the representatives present for an expression of ideas. Everything from the dealer's problems to the electrical home, which is being built by the League, were discussed. The success of the meeting was reflected in the fact that it was decided to hold similar monthly meetings at the call of S. W. Bishop, executive manager.

National as well as local manufacturers were represented, as shown by the following list of attendants:

H. Alex Hibbard, Alex Hibbard, Inc.; Bert Rowley, J. F. Senior and A. R. Woolley of the Edison Electric Appliance Co.; A. H. Cook, Commercial Switch Board Mfg. Company; R. W. Elliott, Albert Sechrist Mfg. Company; C. B. Hoffa, Pittsburgh Lamp, Brass and Glass Company; R. I. Darrow, B. K. Sweeney Electrical Company; W. T. Wells, Mountain States Machinery Company; T. B. Burniture, National Metal Molding Company; E. P. Kipp, Hazard Mfg. Company; G. O. Hodgson, General Electric Company; J. P. Sprunt, Jr., Westinghouse Electric & Mfg. Company; R. J. Horn, Gillespie-Eden Corp.; L. M. Cargo, Westinghouse Electric & Mfg. Company; and A. F. McCallum, Westinghouse Electric & Mfg. Company.

National N. E. L. A. Convention at Atlantic City May 15-20

The national convention of the National Electric Light Association will be held in Atlantic City May 15-20, according to an announcement made recently by President Bump. In connection with the convention there will be an educational electric exposition in which manufacturers from all parts of the country will participate. The exposition will include all latest scientific developments in the application of electricity. A national drive for more and better business has been undertaken by the association as the result of a meeting representative of all branches of the electrical industry held in New York recently.

Los Angeles Engineering Bodies Elect Officers for 1922

Two Los Angeles engineering societies have elected officers for the new year recently. The Los Angeles section of the American Society of Civil Engineers will be headed by Ralph J. Reed as chairman. Other officers are: F. D. Howell, first vice-president; W. H. Code, second vice-president; E. R. Bowen, treasurer; F. G. Dessery, secretary, and W. K. Barnard and H. W. Dennis, directors. H. Z. Osborne, Jr., chief engineer of the Los Angeles board of public utilities, has been chosen chairman of the local chapter of the American Association of Engineers. Others elected to office are Hulbert C. Ferry, W. W. Patch, W. D. Armstrong, C. W. Koiner, W. B. Leeds and J. B. Lippincott.

The regular meeting of the advisory committee of the California Electrical Cooperative Campaign will be held at Del Monte on January 25, in conjunction with the quarterly meeting of the Pacific Coast Division of the Electrical Supply Jobbers' Association which will convene at Del Monte January 25-28.

Pacific Coast electrical interests are mobilizing for an attempt to bring the next annual convention of the Lighting Fixture Manufacturers' Association and the Lighting Fixture Dealers' Society of America to the Pacific Coast. The two organizations will meet for the 1922 convention at Milwaukee on January 30. At that time Pacific Coast delegates will put forward the proposition of holding the next meeting in either Los Angeles or San Francisco.

COMING EVENTS

WESTERN ASSOCIATION OF ELECTRICAL INSPECTORS
Annual Meeting—Chicago—January 17, 18, 19, 1922

PACIFIC COAST DIVISION, ELECTRICAL SUPPLY JOBBERS ASS'N
Quarterly Meeting—Del Monte, Cal.—January 25-28, 1922

LIGHTING FIXTURE DEALERS' SOCIETY OF AMERICA
Annual Meeting—Milwaukee—January 30-February 2, 1922

NATIONAL ELECTRIC LIGHT ASSOCIATION
Annual Convention—Atlantic City—May 15-20, 1922

PACIFIC COAST ELECTRICAL ASSOCIATION, AFFILIATED WITH N. E. L. A.
Annual Meeting—Riverside, Cal.—April, 1922

IDAHO IRRIGATION CONGRESS, SOCIETY OF ARCHITECTS AND IDAHO CHAPTER, A. A. E.
Joint Convention—Rupert, Idaho—January 16-20, 1922

AMERICAN ELECTROCHEMICAL SOCIETY
Spring Meeting—Baltimore—April 27-29, 1922

Idaho Organizations Will Hold Joint Convention

The joint convention of the Idaho Society of Architects, the Idaho chapter of the American Association of Engineers and the Idaho Irrigation Congress will be held in Rupert, Idaho, January 16 to 21, inclusive.

"As these three branches of engineering are mutually interested in the growth of the industry, the practice of holding their conventions together has gone a long way towards bringing about a coordination of operations necessary to the rapid development of the natural resources of the country," said T. W. Halliday, chairman of the program committee.

During the week's program about twenty-five speakers from different parts of the country will appear. Their topics will be announced later. As a special feature, a manufacturer's exhibit of engineering specialties and equipment is being arranged for.

Corporation Increases Sales in British Columbia

Cooperation in the electrical industry made possible the recent very successful campaign for Christmas business for the electrical dealers in British Columbia. Through the Electrical Service League of British Columbia the industry conducted an advertising campaign lasting approximately six weeks, promoting the electrical appliance as a Christmas gift.

About the middle of November, attractive window cards were published showing the actual cost of operation of various appliances. These were used in window displays of the various appliances listed. Following this, streamers in red and green colors were displayed by all the dealers in the province, carrying the slogan, "Say Merry Christmas Electrically."

Beginning December 16, continuing until December 22, the daily papers carried large advertisements prepared by the League. This advertising ran for three days in Vancouver, four days in New Westminster, and three days in Victoria, and produced excellent results.

The dealers in British Columbia all report a splendid Christmas business, in many cases a very considerable increase over the same period last year.

The January meeting of the California State Association of Electrical Contractors and Dealers will be held in Sacramento on January 21. Members from San Francisco and Oakland are planning an excursion in connection with the meeting on the river steamer, "Pride of the River" which has been chartered for the excursion. The delegates will leave San Francisco Friday evening, January 20, and will arrive in Sacramento the next morning.

For the first time in the history of Wisconsin the tax commissioners of that state are to levy an impost on a municipal utility, the electric plant of Stoughton having made itself amenable to state taxation by extending its service outside of the city. Stoughton will be forced to apply to the Public Service Commission for permission to increase its rates to meet the tax.

Personals

Wilbur E. Coman, vice-president and general manager of the Washington Water Power Company of Spokane, recently resigned from that post to become western traffic manager for the Northern Pacific Railway with headquarters in Seattle. Connected for many years with various railroads, Mr. Coman became associated with the power company two years ago. He has

W. E. COMAN

been one of the most active workers in the electrical industry in the Northwest during his association with it. His first position with the railroads was when a youth with the Oregon-Washington Railway and Navigation Company. In 1909 he became general freight and traffic agent of the Spokane, Portland and Seattle Railway, a position he held until 1914 when he resigned to become vice-president and general manager of the Northwestern Electric Company of Portland.

Robert W. A. Brewer, consulting mechanical engineer, well known on the Pacific Coast in connection with his supervision over the manufacture of wireless apparatus for the British Government during the war, has been awarded the Bessemer Premium by the Society of Engineers, of London, for his work in the development of radio equipment while stationed in San Francisco. This is the second time Mr. Brewer has received this honor, the premium having been presented to him ten years ago for his work in connection with two-cycle engines.

William M. White, engineer for the Allis-Chalmers Manufacturing Company, who just returned to the United States from the Orient, forsook engineering for exploring while visiting the mountainous district of the island of Formosa. Mr. White was the fourth white man to enter this district and the first to photograph the savage headhunters with whom the Japanese are having such trouble.

A. E. Holloway, superintendent of the Commercial Department of the San Diego Consolidated Gas and Electric Company, has been elected president of the San Diego Electric Club.

H. C. George, oil recovery engineer of the San Francisco office of the U. S. Bureau of Mines, has returned to his office after an extended trip through the mid-continent and eastern oil fields, gathering data for the preparation of a booklet on "Surface Equipment for Oil Well Pumping."

Louis Glass, president of the Manila Telephone and Telegraph Company, arrived in San Francisco from the Philippines recently en route to the East on a business and pleasure trip.

Ralph R. Woolley, hydraulic engineer with the United States Geological Survey, has been appointed head of a body to make a complete water survey of the Uintah basin country in Utah. He will be assisted by **C. C. Jacobs,** engineer for the Provo Reservoir Company.

M. J. Gavin, in charge of the U. S. Bureau of Mines oil shale investigations at Boulder, Colo., spent the greater part of the month of December at the San Francisco office of the Bureau.

Dr. Robert A. Millikan, director of the Norman Bridge Laboratory at the California Institute of Technology, has returned to Pasadena with **Professor H. A. Lorentz,** of Haarlem, Holland, world-famous mathematical physicist, who will deliver a series of lectures at the institute during the winter quarter. While in the East Dr. Millikan inspected the million-volt transformer which is to be installed on the institute campus by the Southern California Edison Company for test purposes.

General George Goethals, builder of the Panama Canal, is reported to have been retained to investigate and report on the feasibility of the proposed $320,000,000 Columbia Basin irrigation development.

W. H. Phelps, assistant division engineer for the Southern Pacific Company, has been chosen to head the delegation from the local section of the American Association of Engineers to the San Francisco Engineering Council. The other members are **Captain A. J. Capron** and **D. L. Reynolds.**

J. C. McPherson, former superintendent of the electric division of the Southern Pacific Company in Oakland, Alameda and Berkeley, has returned to his former post after two years as general superintendent of the Pacific Electric Railway in Los Angeles. During the war Mr. McPherson served as a captain of the engineers overseas. His new title is superintendent of the East Bay Electric Division.

Clare N. Stannard, secretary of the Denver Gas and Electric Light Company, has been appointed a member of the Denver Tourist Bureau for the present year. **Ben F. Read,** of the Mountain States Telephone and Telegraph Company, and **E. S. Kassler** of the Nevada-California Electric Corporation were also appointed members of the board.

Major Harry Kluegel, San Francisco engineer, has been appointed chief of the Division of Water Rights of the California Department of Public Works to succeed **Captain Charles H. Lee.** Major Kluegel was formerly chief engineer for the Mt. Whitney Power and Electric Company and the Yosemite Power Company. Later he was in charge of the water supply investigations for Denver, Colo. During the war he held important positions of an engineering nature in the quartermaster's department.

E. B. Criddle, general agent, Southern Sierras Power Company heads the Rate Research Committee of the Pacific Coast Electrical Association, affiliated with the N. E. L. A. Other members of the committee are **A. W. Childs,** superintendent of sales, and **I. H. Lecklider,** assistant to the mechanical and electrical engineer, Southern California Edison Company; **F. C. Piatt,** electrical engineer valuation department, Pacific Gas and Electric Company; **J. B. Black,** general sales manager, and **H. F. Jackson,** general manager, Great Western Power Company; **M. E. Newlin,** manager, Fresno district, and **Lloyd Henley,** statistician, San Joaquin Light and Power Corporation; and **A. E. Holloway,** superintendent of the commercial department, San Diego Consolidated Gas and Electric Company.

George J. Eberle, consulting economist and statistician and professor of public utilities and statistics at the University of Southern California, has opened an office in Los Angeles for the purpose of conducting investigations of the financial conditions of public utilities and industries on the Pacific Coast. He was retained by the British Columbia Railway Company, to appraise its properties for determining the assets for rate making.

H. H. Jones, general manager of the San Diego Consolidated Gas and Electric Company, has been appointed one of the five trustees of the San Diego Chamber of Commerce, who are charged with making a drive for the purchase of 1000 acres of industrial land adjacent to that city's harbor. The announcement that Mr. Jones will take part in this activity indicates that the men of the electrical industry are thoroughly cognizant of the industrial future of the West and are cooperating in the promotion of industrial enterprises. Mr. Jones

H. H. JONES

is a graduate of Lehigh University, and a veteran of the Spanish-American war. For several years he was connected with various eastern railroads and came West to take part in the construction of the Denver Tramway Company's power plant. He entered the H. M. Byllesby organization in 1909 as manager of the Northern Idaho and Montana Power Company. After one year in this position he was transferred to the position he now holds. Mr. Jones is an active participant in the civic and commercial welfare of San Diego and was a vice-president and director of the Panama-California Exposition.

Viscount Eiichi Shibusawa, one of Japan's foremost financiers and director of several of the largest power companies in Nippon, has been in California studying Japanese immigration in that state. The survey is being made with a view to promoting cordial relations between the two nations.

S. L. Napthali, former general manager of the Great Western Power Company, has again become connected with that company, a detailed announcement of which will appear at a later date.

H. W. Turner, pioneer in the electrical industry in the West, has retired from active participation in matters electrical, to Carmel-by-the-Sea. For many years "Daddy Harry Turner," as he is affectionately known, was general manager of the Montana Power Company, and is at present the owner of the Montana Electric Company of Butte and the Washington Electric Supply Company of Spokane.

C. G. Gauntlett, Pacific Coast manager for the Safety Insulated Wire & Cable Company, with headquarters at San Francisco, has just returned from a visit to Scotland where he has been studying the business and commercial recovery of European markets, in addition to enjoying a well earned vacation.

Dr. Frank B. Jewett, chief engineer of the Western Electric Company, is being proposed for president of the A. I. E. E., to be voted on by the membership during the spring of this year. Mr. Jewett is a native of Pasadena, California, and graduated from the Throop Institute of that city in 1898. He took his doctor's degree at the University of Chicago in 1902, after which

DR. F. B. JEWETT

he became research assistant to Prof. A. A. Michelson at the University of Chicago. During the war Dr. Jewett rendered eminent service in the research department of the Signal Corps, with the title of Lieut. Colonel. It will be recalled that four years ago Dr. Jewett was nominated for the office of president of the Institute, but declined to accept it on account of ill health. His health has since been fully restored and it is with a great deal of interest that western men are looking toward his nomination to this important office.

F. S. Henderson, manager of the Western Light and Power Company at Boulder, Colorado, is building a bungalow for himself which will be completely equipped electrically and which will serve at the first home electrical in that community.

Dexter S. Kimball, recently installed president of the American Society of Mechanical Engineers, contemplates a visit to western engineering centers during June of the current year. Mr. Kimball will visit practically all of the western society sections at that time and his visit is being looked forward to with a great deal of interest in the West, as it will be recalled that Mr. Kimball worked for many years at the Union Iron Works in San Francisco and later graduated from Stanford University.

Major-General William Murray Black, former chief engineer for the U. S. Army, has returned to the United States after two months spent in China making a survey for the $14,000,000 harbor improvements contemplated at Shanghai. General Black was called from the retired list to represent this country on the board of engineers charged with the work. He is well known on the Pacific Coast from his activities in various developments coming under the jurisdiction of the army engineers.

F. E. Johnson, sales manager of the M. W. Kellogg Company, manufacturers of welded pipes and specialties, is now visiting metropolitan centers of Japan and India.

W. R. Putnam, vice-president and general manager of the Idaho Power Company, as president of the Northwest Electric Light and Power Association, attended the December meeting of the Executive Committee of the N. E. L. A. in New York City. Mr. Putnam gave an interesting description of the work of his association in the Northwest and described in detail the recent snow storm that banked up a pile of snow and ice seventy feet in height along the Columbia Highway near Multnomah Falls.

Herbert Fleishhacker, vice-president of the Great Western Power Company; **Wallace Alexander,** president, and **Robert Newton Lynch,** manager of the San Francisco Chamber of Commerce; **J. C. Clarke,** associate professor of electrical engineering at Stanford University; **E. A. Wallis,** Pacific Coast manager of the Western Electric Company; and **Robert Sibley,** editor of the Journal of Electricity and Western Industry, are among those who have just returned to San Francisco after extended business visits in eastern centers.

P. M. Parry, commercial manager of the Utah Power and Light Company, has been elected chairman of the advisory committee of the Rocky Mountain Electrical Cooperative League for the new year. As a representative of the central station on the committee since the inception of the league a year ago, Mr. Parry thoroughly understands its workings and the year ahead promises to be a most properous one for the organization under his leadership. An ardent believer in the doctrine of cooperation among the men of the industry, he has directed the cooperative efforts of the power company among the dealers in the Intermountain district. The other officers of the advisory committee who will work with Mr. Parry are Vice-President J. A. Kahn, president of the Capital Electric Company of Salt Lake City, and Secretary-Treasurer R. M. Bleak, superintendent of lighting and appliance sales, Utah Power and Light Company.

Henry M. Shaw, president of the Atlantic-Pacific Radio Supplies Company, has recently completed the installation of one of the most powerful radio broadcasting stations on the Pacific Coast in his home in the Rock Ridge section of Oakland. Mr. Shaw was

H. M. SHAW

chosen by the war department to assist in the development of radio equipment for England and America during the war, he came to San Francisco and became connected with the Moorhead Laboratories. He has had a substantial part in giving the West this radio enterprise.

H. Alex Hibbard, prominent Denver manufacturer's representative, is a member of the committee responsible for the equipment to be placed in the first electrical home now being built by the Electrical Cooperative League of that city.

D. W. Boylan, Pacific Coast manager of Johns-Manville Company; **T. E. Bibbins,** president of the Pacific States Electric Company; **J. D. Barnhill,** of the advertising firm of Evans & Barnhill, are among those who are absent from their San Francisco headquarters and are visiting in eastern business centers.

W. F. Durand, professor of mechanical engineering at Stanford University, has left for a visit to European centers, to be gone for several months.

Obituary

William O. Fouch, president of the Western Electric Works of Portland and one of the foremost men in the electrical industry in Oregon, died recently. He was affectionately known among the electrical men as the founder of the electrical contracting business in Portland. He came to the Northwest in 1888 from Illinois and immediately started a contracting business. The present manufacturing business was started in 1891. He was instrumental in organizing the first Oregon electrical contractor-dealers' association and on two different occasions served as president. He was president of the Manufacturers' and Merchants' Association of Oregon at the time of his death. His loss will be keenly felt by his associates and the electrical industry.

The Flint Electric Company of Denver has become a member of the Electrical Cooperative League of that city.

The service department of the **Westinghouse Company** for the entire Rocky Mountain region has been placed under the direction of **A. F. McCallum** of Denver.

The Morganite Brush Company, Inc., New York, announces that its agency in southern California, formerly held by Charles W. Farnham, has been concluded and that it is at present being represented in that territory by the **Special Service Sales Company**, 502 Delta Building, Los Angeles.

Thor products have received additional representation in Denver in the opening of a stall in a prominent south side market by the **Baker Electric Company**, which concern is featuring home laundry equipment.

The Sechrist Manufacturing Company of Denver, one of the largest fixture manufacturing concerns in the Rocky Mountain region, has patented and is now producing an electric pressure cooker with a three-heat element.

The Colorado Electric Machine Company of Denver has been taken over by the firm of Nollenberger and Dorner, prominent contractor-dealers of that city.

Wm. E. Gunther of Denver has taken charge of the Universal appliances for the New England Electric Co., jobbers in that territory.

Scott Bros. Electric Company of Denver has installed an automatic dimmer for the control of the new lighting system in their display window which has as a feature a variety of color screens mounted on X-Ray reflectors concealed behind a valance on the window glass.

The 1900 Washer Company, through its representative, **George Williams,** has taken membership in the Denver Electrical Cooperative League.

J. A. Rockwood, valuation engineer of the Portland Light and Power Company, has returned from a business trip to the national capital at Washington, D. C.

The Mine and Smelter Supply Company, prominent Denver jobbers, held its annual salesmen's convention in that city during the last week of December. Thirty-five salesmen and a number of eastern manufacturers' representatives were present.

The Mountain Electric Company, Denver jobbers for the Edison Electric Appliance Company, has installed a new wall show case for the display of hollow-ware and small heating appliances.

Hendrie and Bolthoff, one of Denver's largest jobbers, gave a New Year's dinner to its 280 employes. Speakers of the evening included **E. B. Hendrie** and **H. P. Waterman,** officers of the company. It was announced that the H and B summer house for employes at Buffalo, Colo., would be doubled in capacity by June.

C. E. Silsbaugh Company, Caldwell, Idaho, has inaugurated a selling contest among school children in connection with a newly installed line of electrical appliances of all kinds.

S. H. Lanyon, San Francisco sales engineer, has been appointed Pacific Coast manager for the Okonite Company, Passiac, N. J., manufacturers of insulated wire, cable and tape.

Manufacturer, Dealer, and Jobber Activities

R. S. Willoughby, dean of Denver electrical contractors, has secured patents on a new aluminum pressure cooker which will later include electrical heating apparatus. His company is known as the Three-in-One Pressure Cooker Company and a small factory has been opened at 335 West Colfax Avenue. As soon as representatives have been secured for every state, production of the cookers on a large scale will be made, the company announces.

The Habirshaw Electric Cable Company, Yonkers, N. Y., in a recent issue of "The Wire Message," the company's monthly publication, explains the appointment of receivers in equity for the concern. The announcement, the statement explains, is merely a step in the reorganization of the company, and in no way affects the business or future progress of the company.

The Hubbard Machine Company, San Francisco, manufacturers of well pumps and machinery for testing crude oil, has developed a new unit which incorporates a double-acting cylinder, designed to give a continuous flow of water as well as a higher volumetric efficiency than the rodinary type. A second feature is a newly developed power head which converts rotary motion into a reciprocating one. Tests are being made on a unit which has been installed for the Pacific Gas and Electric Company.

The Lapp Insulator Company, Inc., Le Roy, N. Y., has announced its representatives for the Pacific Coast and far western territory. **S. H. Layton,** 507 New Call Building, San Francisco, will handle the company's material for the Pacific Coast territory. Utah, eastern Nevada, southern Idaho, and western Montana will be covered by the **Capital Electric Company,** Salt Lake City, while the **Butte Electric Supply Company** will handle the Montana territory.

The San Francisco offices of the **Crocker-Wheeler Company,** Ampere, N. J., manufacturers of motors, have been moved from the Crossley Building to the Atlas Building.

The Veteran Electric Company, Vancouver, B. C., recently won the distinction of having the best decorated window in British Columbia, in connection with the Armistice Day celebration. The window urged the purchase of memorial poppies, the funds from which were devoted to the aid of war sufferers. A feature of the display was that all of the members of the firm are returned war veterans.

The Ajax Specialty Company, St. Louis, Mo., has appointed the Barnett Sales Company, Lumbermen's Building, Portland, as its representative in the Pacific Northwest. The Electric Agencies, of San Francisco has been appointed California representative for the company.

The Western Agencies Company, of San Francisco, recently gave a banquet at the States Restaurant to all members of the sales force for America vacuum cleaners. Arthur C. Maryon acted as toastmaster.

The Wagner Electric Manufacturing Company, St. Louis, Mo., has placed on the market a new polyphase motor under the trade name of "Pow-R-full." The design incorporates suggestions from motor users and suggestions from engineers gathered during the last ten years. The motor is described in bulletin No. 129.

The Wells Morris Manufacturing Company, San Francisco, has moved into its new factory in Folsom street. G. F. Wells, manager of the concern, is optimistic regarding the industrial future of San Francisco, and states that with enlarged quarters and new equipment, the concern will be in a better position to cope with the increasing industrial demands.

The Ward Leonard Electric Company, Mt. Vernon, N. Y., has issued section A-3, describing its automatic motor starter, and section D, describing its Vitrohm field rheostats, both to be added to the regular catalog.

The P. A. Geier Company of Cleveland, Ohio, has issued a pamphlet, "How to Secure a Prospect List," which enumerates for the benefit of dealers and salesmen 31 tested ways of finding prospective buyers for household appliances. The booklet is a boiling down of trade paper suggestions and salesman and jobber experience.

The Holophane Glass Company, Inc., New York, has perfected the Holophana lightmeter, an accurate, portable instrument designed for the measurement of foot-candles, and other units of illumination. The instrument is described in bulletin No. 343, which is ready for distribution.

COOPERATIVE CONVERSATION

Robert L. Eltringham, manager of the California Electrical Cooperative Campaign, is pointing at something mutually agreeable to Albert H. Elliot, secretary of the Pacific Coast Division of the Electrical Supply Jobbers' Association. In fact the "golden-tongued" Mr. Elliot seems spellbound at the sight and is letting "Bob" do all of the talking. If we had three guesses as to the topic of the conversation and the reason for the smiles, we should say, "Lady. Lady. Lady."

Business Outlook in Western Market Centers

Reflecting the Trend of Community Thought on Conditions and Events Affecting Business and Industrial Activities Throughout the West

Compiled and edited for the Journal of Electricity and Western Industry by correspondents in all principal Western cities.

BUILDING PERMITS AND BANK CLEARINGS FOR DECEMBER IN 7 WESTERN CITIES

	No. of Permits	Value	Bank Clearings
San Francisco	568	$2,700,705	$613,500,000
Los Angeles	3,364	9,168,851	407,624,000
Spokane	115	88,225	44,878,000
Seattle	518	494,835	142,149,000
Portland	731	845,055	130,244,000
Salt Lake City	117	404,595	69,572,000
Denver	243	713,200	130,174,000

SAN FRANCISCO

Building activities increased noticeably during November and December and the year closes with a strong undercurrent of optimism, noticeably absent during the latter half of the year. Wholesale lumbermen report a stronger demand for materials with firmer prices.

Demand for lumber showed a marked increase over other months of the year, and price advances were generally maintained. The reasons for increased activity were greater demand on the part of all wood working crafts, larger buying of car material for repairing and new rolling stock, laying in stocks on the part of many lumber yards, and export shipments, especially to Japan. Resumption of activity on the part of California and northern California mills resulted in measurably decreasing unemployment in the large centers of the Pacific Coast.

Savings banks report increasing deposits following the withdrawals during the building trade wage readjustment.

SEATTLE

Lumber business in sight from railroads, large eastern industrial centers, and the Orient, is sufficient to call for full producing strength for the sawmills and logging camps of the Northwest during the coming year. At present, orders are exceeding actual production in all points of the Northwest, and the lumber stocks in the various yards are rapidly being depleted.

As a result of a revival in Oriental trade, the backbone of Seattle's foreign commerce, 29 ocean steamships will sail from Elliott Bay for the far East during January, as compared with 12 steamships in January, 1921.

Washington's wheat crop this year totaled 51,200,000 bushels, according to estimates made by the State Department of Agriculture following reports from licensed warehouses throughout the state. The Yakima and Wenatchee valleys, and other fruit-raising sections east of the Cascades also report a highly satisfactory and profitable year of production.

The unemployment situation, due to the reopening of camps and mills, and allied industries, is gradually showing improvement.

LOS ANGELES

With the returns for building permits in December, shown above, the total for the year in this city reached 37,206 permits, involving an expenditure of $82,761,000. This is an increase of approximately 300 per cent over 1919.

Rainfall throughout this section is now above the average for the last six years. This is looked upon as being of inestimable value to the farmers and fruit growers. The damage as a result of a heavy downpour during the holidays was not serious except in a few limited sections.

Electrical jobbers and dealers find in closing their books for the past year that they have handled a larger volume of goods at 25 to 30 per cent lower inventory value than were sold during 1920, and in many instances the actual cash sales exceed the figures of the previous year. The last few months were far better than the earlier part of the year and this gives much encouragement to the trade. All agree that the business is to be had but the sales competition is much more strenuous than in 1920.

PORTLAND

Portland enters 1922 with bright prospects for a prosperous year. The worst of the depression is over and there is a feeling of optimism on all hands. A fine building record was established, postal receipts passed the two million dollar mark, being the highest in the history of the city, and export business showed a gain of approximately 6 per cent, which although small is nevertheless quite significant because of the fact that Portland, according to report, is the only Pacific Coast port to show a gain in export business during 1921. Although the lumber industry is a little quiet at the present time and will remain so for 30 to 60 days, the outlook for a rapid recovery to normal is exceedingly bright. A number of large orders have either been placed or are in sight and mills which have been shut down for a year or more are planning to resume operations.

Volume of Christmas business in all lines is reported as very satisfactory and in the electrical business many jobbers and retail stores report this year's business in excess of that of last year.

Because of the large amount of building, electrical contracting business during the last half of 1921 was very active and it is predicted that it will be still more active throughout the ensuing year.

SALT LAKE CITY

General indications in the intermountain section point to improved business conditions. The distribution and circulation of the war finance corporation allotments to the sheep, cattle and sugar beet raisers have materially helped the situation, particularly in the agricultural districts. The banks report conditions rather quiet, with not much demand for new loans, but many requests for renewal of notes. The unemployment situation remains practically unchanged. Holiday trade among the retail dealers was fairly satisfactory, although at the present time the usual seasonal slump is in effect. Collections are reported as fair.

DENVER

Christmas buying in all lines was about 25 per cent under the 1920 records and while the department stores showed a falling-off of 30 to 40 per cent, reports from electrical jobbers and dealers indicate an average decrease of not over 15 per cent. Sharp reductions in clothing and annual clearance sales stimulated buying immediately after the holidays with a period following in which goods moved slowly.

Unemployment is increasing and it is not impossible that building wages will be reduced shortly. A mild winter thus far fortunately has kept building construction up and unemployment down. On the other hand, it has resulted in the closing down of a number of coal mines because of the lack of orders.

Loans of all natures are hard to obtain and with collections slowing up, credit is limited. Few failures are being reported and representative bankers feel that conditions will improve.

SPOKANE

A more optimistic outlook in business and agricultural circles is apparent in the first days of 1922. This is due in large measure to the improved business conditions which have obtained in the last three months. In this period, lumber, dormant during the entire nine months preceding, showed activity, an immense apple crop was harvested and the proceeds of a good wheat crop was sold. Lumbermen now look forward to a considerably increased business this year. The mining men of the Coeur D'Alene silver lead district look for renewed activity during 1922, basing their hope on the fact that Butte, where copper is the chief metal mined, has resumed operations.

Construction News and Industrial Developments

Suggesting to the Engineer, Contractor, Manufacturer, Dealer, Agent and All Business Men Opportunities for New Business

THE PACIFIC NORTHWEST

MARSHFIELD, ORE.—The North Bend Mill & Lumber Co. plant was opened on Jan. 10. The plant will employ over 100 men.

SEATTLE, WASH.—The county commissioners announce that they are ready to appropriate $50,000 for flood-damaged roads and bridges.

CHEHALIS, WASH.—The city commission recently adopted a resolution providing for a standard street lighting system, which will include the principal business streets of the city.

EUGENE, ORE.—This city has filed an application with State Engineer Percy Cupper for 2500 sec.-ft. of water from the McKenzie river in Lane county for municipal power development.

YAKIMA, WASH.—Burnet & Deming of Seattle were the lowest bidders on the general irrigation system contracts bids recently opened by the city commission. Their figure was $181,877.50.

OLYMPIA, WASH.—Articles of incorporation have been filed by the Northwest Storage Battery Co., Spokane, through John A. Peacock. The incorporators are H. W. Brow, V. L. Rinehart and E. W. Douglas.

SPOKANE, WASH.—Permission to build a bridge across Snake river at Central Ferry was granted recently by a bill passed by Congress. The bridge is to cost $300,000 and will be a joint state and federal project.

WINLOCK, WASH. — The Cowlitz Mission Electric Company has been incorporated here by Joseph Sommers, Andrew Rusher, Henry Stendenbach, et al. The new company plans to engage in the general lighting and power business.

WHITE SALMON, WASH.—The factory of the Laurel Box Co. was recently destroyed by fire, involving a loss of $20,000 to boxes and lumber and $25,000 to the plant. Harrison & Huft, the owners, are planning to rebuild in the spring.

BREMERTON, WASH.—Morgan & Co. of Tacoma were awarded the contract for the entire construction of the section of the Navy Yard highway from Charleston to the head of the bay, which includes the building of two concrete bridges. Their figure was $79,000.

AUBURN, WASH.—The cost of repairing flood damages is estimated at $91,700 by the county engineer. Bridge repair work in the northern district will require $29,000, that in the southern district $11,000, while the remainder will be required for highway repair.

BELLINGHAM, WASH.—The Bloedel-Donovan Lumber Company is considering the proposition of building 20 miles of railroad on the Olympic Peninsula for the transportation of logs from its timber holdings to tidewater. The company has 700,000,000 feet of timber in this area.

CHEHALIS, WASH.—The Coy Valve Co. is planning the erection of a large plant for the manufacture of small machinery equipment. W. Graham, manager of the plant, recently sold his factory, the Graham Valve Works, in Indiana. Construction work is to start in about 60 days.

PORTLAND, ORE.—Bids are being asked for the construction of the Bridge of the Gods, to be located on the site of the mythical bridge at Cascade Locks, according to Dorr E. Keasey, who has organized a corporation to start the project. The bridge will be 1500 ft. in length, with a main span of 705 ft. Plans have been drawn by R. R. Clark. The cost is estimated at $450,000.

SALEM, ORE.—James Lindsey, 438 Worcester Bldg., Portland, has filed an application with State Engineer Percy Cupper for 70,000 acre-ft. storage in Marion Lake behind a dam 100 ft. high. The water is to be used for power and irrigation purposes. The project will cost $225,000.

TACOMA, WASH.—Plans have been completed for the construction of a three-story and basement apartment house building to be erected by Charles L. Epps at North Third Street and Yakima Avenue, at an estimated cost of $30,000. Plans have been prepared by Dutton, Whitney & Duggan of Tacoma.

TACOMA, WASH.—At an approximate cost of $250,000, the Tacoma Ice and Refrigerating Company will erect in Tacoma a modern cold storage and ice-making plant at South 26th and Holgate streets. The proposed plant will be five stories and basement of heavy concrete construction, faced with red brick exterior walls and terra cotta trim.

SEATTLE, WASH.—Martin Beck, president of the Orpheum vaudeville circuit, has announced that his company will immediately build a new theater in Seattle to cost between $750,000 and $1,000,000. He also stated that a new Junior Orpheum will be built in Portland at a cost of $1,000,000. Work on both theaters is to start in the spring.

SEATTLE, WASH.—The city utilities commission has drafted an ordinance for the appropriation of $25,000 to install 170 incandescent and 40 arc lights in various parts of the city. This is the first street light extension to be made by the city since 1917. The city proposes to sell $1,050,000 of a previous light bond issue to cover extensions to be made during 1922.

OLYMPIA, WASH.—Contracts for the Lincoln School building have been signed and awarded as follows: Western Construction Co., Seattle, general contract; Norton & Sangler of Seattle, heating and ventilating; Rushlight & Hasdorf of Portland, plumbing; A. J. Agutter & Co. of Seattle, electrical wiring. Work has already been started by the general contractors.

THE PACIFIC CENTRAL DISTRICT

NAPA, CAL.—The Union Ice Co. is about to start building and equipping a fireproof ice plant to cost approximately $50,000.

SAN LEANDRO, CAL.—M. S. Gaulart will erect a creamery and ice cream plant here for the Hayward Ice Cream Co., in the near future.

SAN FRANCISCO, CAL.—The Italian-American Bank is contemplating the erection of a bank building at the southeast corner of Columbus Ave. and Broadway.

MOUNTAIN VIEW, CAL. — Arrangements have been made for the erection of a $40,000 factory to be called the Growers' Ice and Cold Storage plant of Mountain View.

SHAFTER, CAL.—The Di Giorgio fruit ranch near Arvin is contemplating a vineyard project which will necessitate the spending of approximately $2,000,000. Stroud Brothers of Bakersfield has been awarded the contract for 125,000 ft. of pipe.

FORT BRAGG, CAL.—Ukiah citizens approved a $64,000 bond issue at a recent election for the purchase of the water works of the Ukiah Water and Improvement Co.

WOODLAKE, CAL. — The Western Citrus Honey Corp. is engaged in erecting buildings to consist of a plant shop and warehouses, bunk houses, dining hall, kitchen and garages.

WHEATLAND, CAL.—The California Hemp Industries has purchased 7000 acres of land near here for the building of a city to be known as Hemp. They will also build a $50,000 factory for the extraction of hemp fiber.

PETALUMA, CAL.—The Chamber of Commerce has recently received a telegram from Webster & Crafts, of Massachusetts, accepting a proposition relative to opening a shoe factory building here in the near future.

SANTA ROSA, CAL.—Grace Bros. have plans and specifications ready for enlarging their ice and refrigerating plant. The addition will be constructed of reinforced concrete and will be 60 ft. by 76 ft., three stories high.

SAN FRANCISCO, CAL.—A steel mill will be built in California provided hydroelectric power developments in the near future assure a definite supply of power, according to an announcement made by H. W. Hunsicker of the Sizer Steel Company of Buffalo.

HANFORD, CAL.—Articles of incorporation of the Island Ice Company have been filed at Sacramento. J. Croolman, J. McDowell, J. Madsen, and R. Hamlin are the directors. The company will erect a modern cold storage and ice plant in the near future.

SAN FRANCISCO, CAL.—Plans for a one-story reinforced concrete auto repair and welding plant have been completed by H. Shermund, architect, Hearst Building. The building will be erected near the Chevrolet plant in Oakland and will cost approximately $18,000.

SAN FRANCISCO, CAL.—Preliminary plans are being prepared by Maury L. Diggs, Easton Bldg., Oakland, for new cannery buildings for the H. G. Prince Company. The building will be erected at the present plant on E. 11th and 29th Ave. in Oakland and will cost $100,000 or more.

FRESNO, CAL.—B. G. McDougal, architect, of San Francisco, is preparing the plans for the 10-story hotel to be erected for F. M. Williams and Fred Todd on Tulare street. The structure will be reinforced concrete and is to contain 300 rooms. The cost is estimated at $500,000.

FRESNO, CAL.—Plans for a new cannery for the Sears and Nichols Cannery Company of Chillicothe, Ohio, have been completed, according to an announcement made by W. H. Sears, president of the company. When the Fresno cannery is in operation, other plants will be located at a city in the Sacramento valley and one in the Santa Clara valley. The company operates 18 canneries in the East.

THE INTERMOUNTAIN DISTRICT

YUMA, COLO.—A new Presbyterian church will be built here at a cost of $75,000.

LAS VEGAS, NEV.—The West End Chemical Co., owner of the colemanite or borax ore located near Las Vegas, will soon start work on a mill.

BRUSH, COLO.—The city council has approved plans for paving the main streets at a cost not to exceed $150,000.

BRIGHTON, COLO.—Another state armory is a reality in the breaking ground here for a new $35,000 building which will be constructed of hydro-stone, a local product.

CHEYENNE, COLO.—A five-story building will be constructed at Seventeenth and Capitol streets by Paul H. Moore and associates for business purposes, the cost of which will be over $200,000.

DENVER, COLO.—A new hundred thousand dollar addition for contagious and orthopedic cases will be made immediately to the Children's Hospital through the generosity of Mrs. H. H. Tammen, wife of one of the proprietors of the Denver Post.

DENVER, COLO.—A fifty-apartment building three stories high and costing in excess of $100,000 will be built immediately by Bernard Desjardines of 1777 York St. Permit for the construction at Ninth and Sherman Streets has already been given by the city.

CASTLE ROCK, COLO.—Plans are being made by the city council for the installation of a small municipal lighting system. Should they not be perfected, it is reported that lines from one of the prominent Colorado power companies will be extended to this place to provide lighting.

DENVER, COLO.—Another uptown building will be that of the L. R. Steel Stores Company at 16th and Welton Street, which will be started immediately by the C. S. Lambie Construction Company of this city. When equipped, it is estimated the property will cost approximately $400,000.

SALT LAKE CITY, UTAH.—The town of Junction has filed an application with the state engineer's office for the use of five sec.-ft. of water from City Creek in Piute county to be used in the development of municipal power for Junction and Circleville. The plans contemplate carrying the water through a three-ft. wheel with a head of 1100 ft. for developing 530 hp.

DENVER, COLO.—The Harding, Zook and Bahl Engine Corporation, whose offices are in the First National Bank Bldg., have announced the purchase of a site where they will erect a factory for the production of commercial airplanes. It is intended to have a plant with a capacity of 100 machines for 1922, which will be enlarged later. A. D. Zook is secretary of the company.

SALT LAKE CITY, UTAH.—The Dixie Power Company, through W. W. Vannon, engineer, has filed an application for 15 sec.-ft. of water from Coal Creek in Iron county for the development of 930 hp. The plans call for using the water through a Pelton wheel under a 640-ft. head. The company will also change over the lines and equipment of the Cedar Electric Company, which it supersedes, to three phase instead of single phase, as soon as market conditions justify the change.

THE PACIFIC SOUTHWEST

HUNTINGTON PARK, CAL.—The election for $75,000 water bonds carried in favor of the bonds.

ONTARIO, CAL.—The $121,000 bond issue for the erection of a school building was carried unanimously.

LOS ANGELES, CAL.—Architects Allison & Allison are preparing plans for the erection of a $130,000 high school at Orange.

LOS ANGELES, CAL.—M. C. Fallis is planning the erection of a two-story apartment building on Heliotrope Drive, near Rosewood Ave.

SAN PEDRO, CAL.—Ray Mitchell, Harry Carr and A. H. Brown are planning the erection of the Almiral Hotel at 7th and Mesa Sts., to cost $250,000.

PASADENA, CAL.—Angel & Smith, architects, are drawing plans for a Masonic Temple to be erected at 16th and Chicago streets for Hollenbeck Lodge.

LOS ANGELES, CAL.—It is announced that a new building, to cost approximately $50,000, will be erected by the Beverly Hill Church, Rev. D. M. Donaldson, pastor.

PHOENIX, ARIZ.—The Constable Ice & Fuel Co. will build a $40,000 storage plant adjoining their building on West Jackson street. F. C. Stewart is the contractor.

ANAHEIM, CAL.—D. Jessurun, president of the Anaheim Sugar Company, is quoted as saying his company would contract for the erection of a $250,000 Steffens plant at an early date.

ONTARIO, CAL.—The Ontario Power Company will erect a new power house in San Antonio Canyon to provide additional capacity for its system. The cost will approximate $45,000.

LOS ANGELES, CAL.—Myron Hunt has been commissioned to design a $300,000 addition to the El Encanto Hotel in the foothills near Santa Barbara. The plans call for an addition of 100 rooms.

REDLANDS, CAL.—The Redlands National Bank building will be remodeled and two 3-story additions made, according to plans now being prepared by architects Walker and Eisen of Los Angeles.

SANTA BARBARA, CAL.—The contract for the additions to the St. Francis Hospital has been awarded to J. Y. Parker. Three buildings are included in the bid at a total cost of $215,000.

OXNARD, CAL.—C. W. Sparks was awarded the contract for the ornamental lighting installation. Eighty-six posts will be erected in Lighting District No. 1. The contract price was $12,866.60.

SAN DIEGO, CAL.—The United States Navy bureau of yards and docks has asked for bids on an ornamental lighting system together with all auxiliary equipment for the naval base at San Diego.

UPLAND, CAL.—The San Antonio Hospital Association will erect a new unit to contain 33 beds. The building will have two wings each approximately 200 ft. by 45 ft. Myron Hunt is the architect.

LONG BEACH, CAL.—The Omar Hubbard Apartment Building to be erected at the southwest corner of Broadway and Cedar avenues will cost $550,000. John and Donald Parkinson are the architects.

ALBUQUERQUE, N. M.—C. A. Fellows of Los Angeles was the successful bidder for the new hotel and laundry buildings to be erected for the Santa Fe Railway. The figure is said to be $475,000.

SANTA BARBARA, CAL.—A large annex to the Riviera hotel will be started at once, according to Axel Bern, proprietor. Plans prepared by Myron Hunt call for 200 rooms at an estimated cost of $300,000.

LOS ANGELES, CAL.—Train & Williams are the architects for an addition to the McKinley Ave. school. An auditorium and administration building will be included in the additions, which will cost about $250,000.

SANTA MONICA, CAL.—Dr. Frank J. Wagner will erect an office, bank and store building at 401 Santa Monica Boulevard. The contract has been awarded to W. S. Freeman and the work is to begin at once.

LOS ANGELES, CAL.—Lange and Bergstrom, contractors, have the contract on a percentage basis for the new 12-story office and bank building for the Bank of Italy. The work is to be completed by January, 1923.

LOS ANGELES, CAL.—The Standard Construction Company is the contractor for a frame and corrugated iron boiler house to be erected for the Southern Pacific Company near Wilmington at a cost of $17,613.

CLAREMONT, CAL.—The new chemistry building for Pomona College will be started during January. The contract calling for $200,000 was awarded to Crookshank and Somers of Pomona. Myron Hunt is the architect.

LOS ANGELES, CAL.—The new 12-story class A building to be erected at the southwest corner of 8th and Spring will be under the supervision of architect Roy L. Smith. W. W. Paden and C. H. Price are the owners of the property.

FLAGSTAFF, ARIZ.—The bond issue for the new high school has been sold by the board of education. With the $175,000 now available and Norman F. Marsh of Los Angeles commissioned as architect, it is said that contracts will be let immediately.

PHOENIX, ARIZ.—Lynn S. Atkinson, Jr., of Los Angeles, was the lowest bidder on the Cave Creek flood control dam and reservoir. The bid was $372,294, for a multiple arch dam plus 5 per cent for engineering. Bids were taken under advisement.

SAN PEDRO, CAL.—The Kress Company will lease the new building now being erected by B. B. Lippman at the corner of 6th and Pacific Avenues. Plans are under the supervision of the architects of the Kress Company. The building will cost $150,000.

LOS ANGELES, CAL.—The Harbor Commission has instructed its engineer to prepare plans for a transit shed to be built at Terminal Island. The building will be of frame construction with corrugated iron exterior and roof, and will cost about $815,000.

HOLLYWOOD, CAL.—Edward T. Flaherty, engineer, is taking bids for the 6-story fireproof storage warehouse which is to be used by the Premier Fireproof Storage Company. The building will be erected on Santa Monica Boulevard near the intersection of Cahuenga Ave.

JEROME, ARIZ.—Approximately $160,000 will be expended for a new group of high school buildings in the Jerome District. The plans now prepared by architects Lescher, Kibbey and Mahoney of Phoenix call for structural steel, with hollow tile walls, and stucco exterior.

LOS ANGELES, CAL.—Sealed bids will be received by the Board of Education, at the office of the secretary up to 9 a.m., Jan. 25, for the erection of an addition to the Rowan Avenue school building. Plans and specifications are on file with the secretary, 730 Security Building.

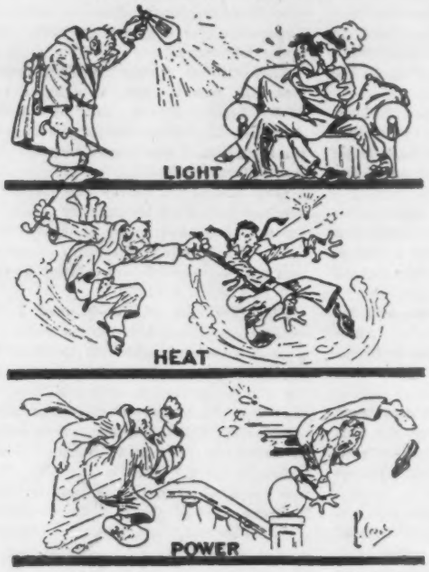
LOS ANGELES, CAL.—Weymouth Crowell has been awarded the contract for a 10-story reinforced concrete brick building to be erected for James H. Adams at a cost of $568,400. R. D. King is the architect. The building will be located on Olive street near 8th and will be occupied by the Southern California Telephone Co. upon completion.

LOS ANGELES, CAL.—Plans are under way for the erection of a $35,000 factory here by the Pacific Autoplane Co., Figueroa near Vernon streets, for the manufacture of a motor car which can be changed into an airplane, invented and patented by Virgil Moore of El Centro. W. J. Waters has been appointed chief engineer of the plant.

SAN PEDRO, CAL.—The supreme council headquarters of the Chief Petty Officers Association has chosen this city for its headquarters and will proceed with the erection of a $100,000 club house. The building will have offices, gymnasium, swimming pool, and club rooms for the accommodation of its members. It will be located convenient to the fleet landing.

PALMDALE, CAL.—The Little Rock Creek Irrigation District has contracted with the Little Rock Power and Water Company for water from the dam which the latter company proposes to build in accordance with the application for the diversion of 50 sec.-ft. and storage of 4500 acre-ft. per annum. S. G. Bennett of Oxnard is acting as engineer for the power company.

Light, Heat and Power



—(Stolen).

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Rules for Pedestrians

In view of the terrific hazards to which the owner of a motor car is submitted by reason of the growing number of pedestrians who infest the streets, owing to the increasing reductions in the size of apartments and the difficulty of remaining at home, the following ordinance is suggested for general adoption:

1. Pedestrians should honk twice at all street crossings. Special caution is urged against such noises as may be confounded with newsboys or building construction. A musical yodel is recommended, although imitations of the calls of domestic animals have been found to bring satisfactory results in warning motorists.
2. Some item of conspicuous clothing, such as a red necktie or rolled stockings should be worn, to facilitate identification in case of accident.
3. Where the foot passenger is not smoking a strong cigar, or wearing diamond shirt studs, head and tail lights should be carried.
4. Stout ladies must keep to the right of the crossing in order not to obstruct movement of the lighter traffic.
5. Ladies carrying umbrellas will be required to come to a complete stop every forty yards and to raise and lower umbrella as a danger signal before advancing.
6. All pedestrians must carry a license for the privilege of living. Examinations in expert dodging, looking in three directions at once and listening to comments of traffic policemen will be conducted by the coroner's office. Should the applicant be run over during the course of the year, the license fee is not refunded.

* * *

A Substitute for Horsepower

A delightful invention for the lazy man is reported from Maskinonge, Canada, where one J. T. Lemyre has invented a machine actuated by a rocking chair which generates enough power to run the washing machine, sewing machine, electric fan, etc. A factory to manufacture this device is to be built at Sorel, Quebec.

The idea is stimulating. Why not a similar machine installed beneath the baby jumper? Or one which could be attached to the brindle cow's tail in fly time? We have often felt that the gestures of grand opera singers could be put to practical service. If there is no budding tenor in the family, possibly a French cook who is conversational might prove a substitute. There is not enough motion involved in modern dancing to offer attractive possibilities, but households possessing a baby might take advantage of father's midnight walk, thus gaining enough power to warm the milk.

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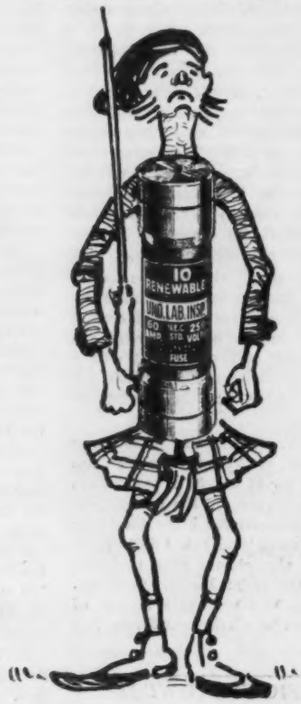
ELECTRICAL HYBRIDS



XIX — The Electric Fusileer

The electric fusileer
Is a sport as may appear—
At least at midnight blowout's he's a daisy.
He can stand an awful charge
Though the load be very large,
Yet at times his swift collapses drive you crazy.

He will keep you in the dark
Till you make a rash remark
When his answer is to sever your connections.
He's a soldier of the line,
Strength and weakness both combine
All the elements that go for your protection.